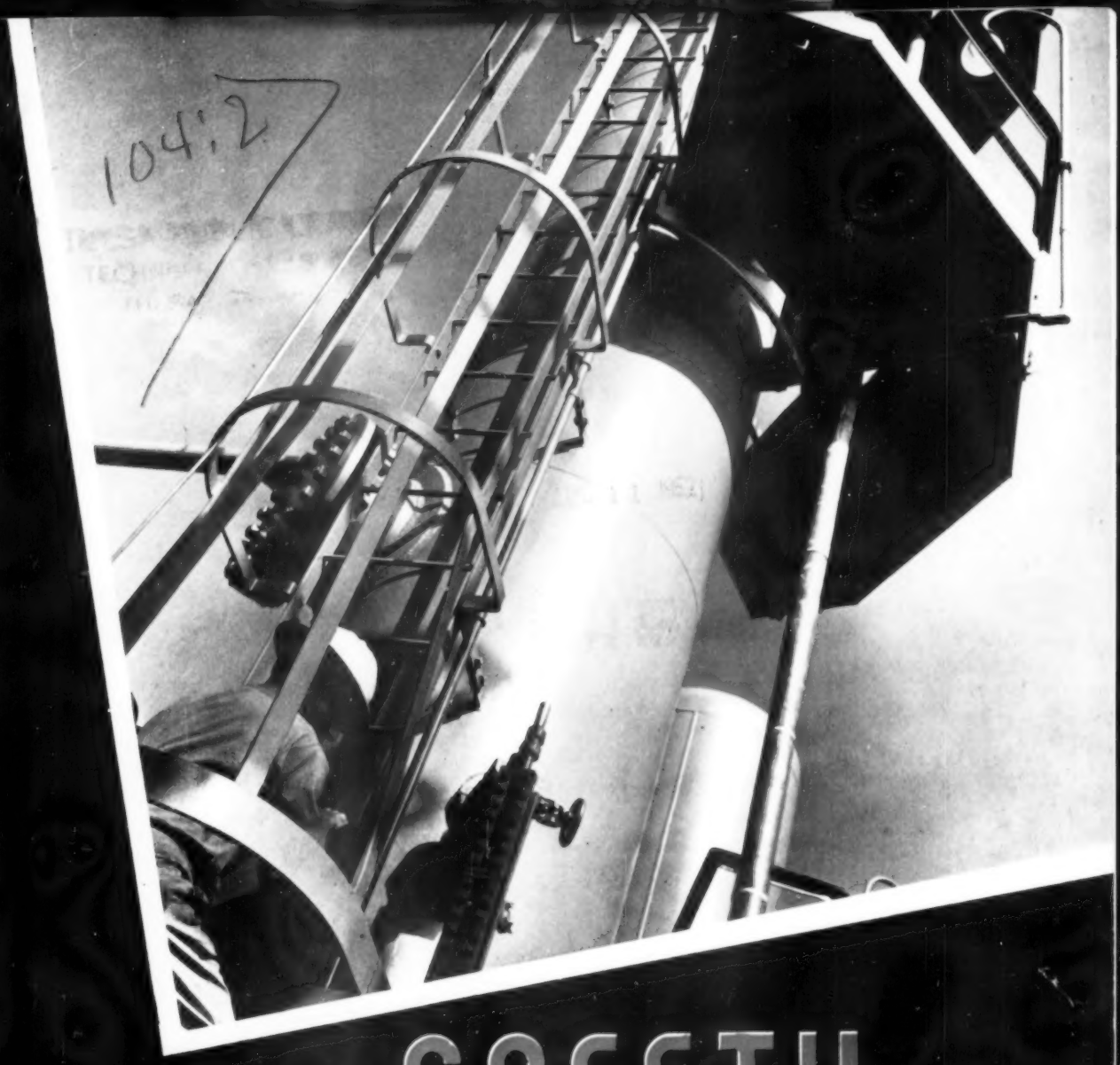

SAFETY MAINTENANCE & PRODUCTION

FORMERLY SAFETY ENGINEERING

AMERICA'S PIONEER MAGAZINE IN ITS FIELD

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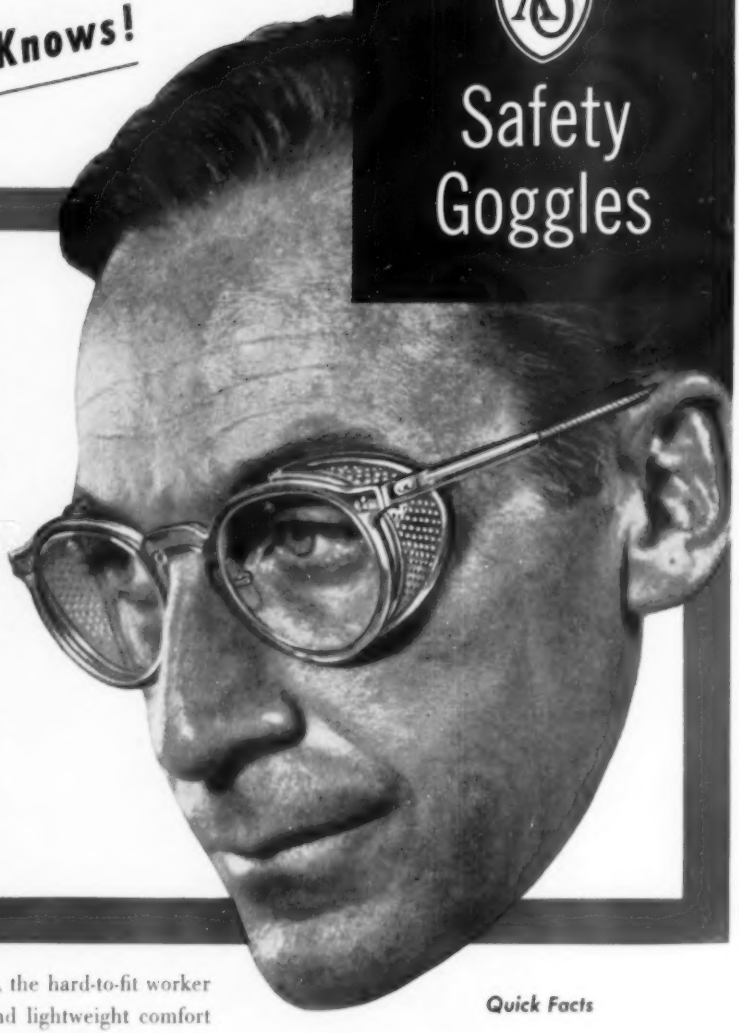

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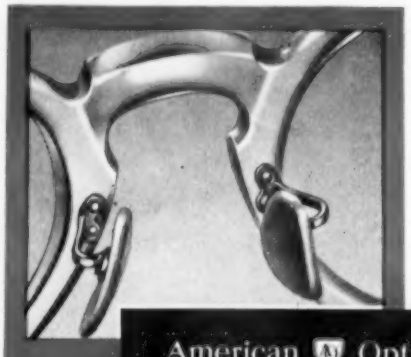

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FORMERLY "SAFETY ENGINEERING"

The Magazine of Safety

A MONTHLY PUBLICATION DEDICATED TO ACCIDENT PREVENTION, MAINTENANCE, HEALTH CONSERVATION AND FIRE CONTROL FOR EFFICIENT PRODUCTION.
EST. 1901

VOL. 104, NO. 2 AUGUST, 1952

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PICTURE CREDITS
Our Thanks for the Courtesy—Cover:
Hydrogen chloride drying tower at Ethyl Corporation's new Houston Ship Channel plant. Picture from "Ethyl News."

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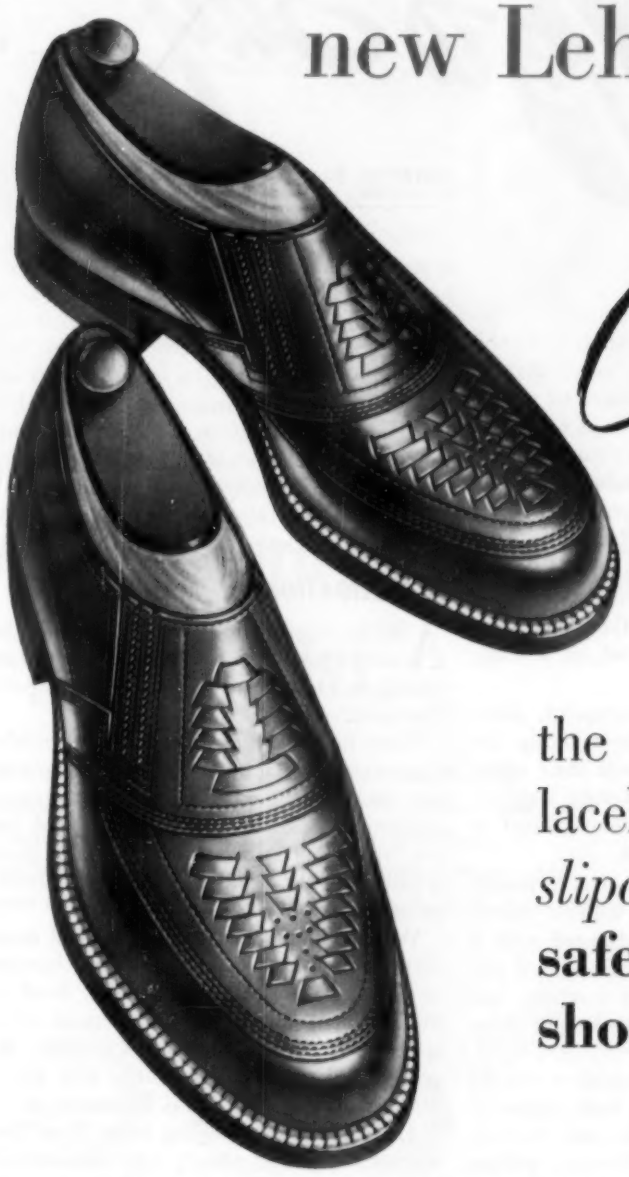

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It's Safe to Say

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★ OBLIGATION OF LABOR

LEST there be the slightest misunderstanding or distortion of the truth, this publication certainly cannot fairly be termed anti-labor any more that it can be called anti-management. Our record of nearly fifty-two years of continuous publication is ample proof that we have been champions of labor's contribution to accident prevention, fire control and industrial health conservation. In fact, it must be emphasized that we are merely "anti-accident" and the chips have fallen and will continue to fall where they may.

It's really hard to believe but, according to material appearing in a great midwestern daily, three men who would not mind losing their eyesight set off a strike at a huge jet engine plant.

According to the newspaper announcement, three machinists objected to a company rule requiring the use of eye protectors and refused to wear their safety goggles on the job. As is customary in most large industries, the goggles were provided by management as a protection against hazards to the eyes.

As a result of the company's unwillingness to permit these three men to continue working without proper eye safeguards, the employer was confronted with a wildcat strike of approximately 500 members of the union of machinists. After a series of meetings, the development mushroomed into a full strike and about 900 men were on the street.

Later, about 3,900 families found themselves without income and it would seem that the basic reason is because three men chose to ignore their own safety by electing to disobey rules designed for their own welfare. How short-sighted can labor be?

Loss of private income, loss to the Treasury in tax revenue, loss to the defense effort of million of dollars worth of jet engines left unoiled and unprotected—all can be laid to the action of just three small cogs in a gigantic wheel. Three men were reprimanded by a foreman for not wearing their eye protective equipment. Reports indicate that the men were "willing" to wear their goggles on hazardous operations, but not otherwise. Must management permit every employee on the job to decide for himself what may be potentially hazardous or should company rules designed for employee safety have some force?

If, as may be imagined, the goggle incident was used as an excuse to precipitate settlement of other differences, then members of the working staff picked an approach which will bring little sympathy. If wages, hours or general working conditions are unsatisfactory, then for heaven's sake let's say so and iron out differences like grown men. On the other hand, if the objection to use of goggles by machinists actually was the sole basis for the strike, the union leaders not only would do well to devote some part of their meetings to the cause of accident prevention but they certainly need a course in safety procedures themselves.

To prove that this editorial page is not "anti-labor," we now draw close attention to the

★ OBLIGATION OF MANAGEMENT

A BILL intended to provide increased safety to coal miners has been passed by Congress and, at this writing, has been signed into law by the nation's Chief Executive.

With his signature, the President made public a statement pointing out that no one should be "misled" into believing the new law is an all-embrasive accident prevention measure. However he stated that the bill is a "significant step in the direction of preventing the appalling toll of death and injury to miners in underground mines."

While the law provides that Federal inspectors may close a coal mine when they discover imminent danger of life loss through fire, explosion, flood or accident, the President cited certain deficiencies which exist despite his recommendations to Congress. A special report to *The New York Times* lists the deficiencies outlined in the Presidential statement as:

1. Coal mines employing fewer than fifteen persons are not required to comply with mine-safety provisions, even if a major disaster is imminent.

2. The law is directed solely against major disasters which are responsible for about 7 percent of fatalities in the last twenty years.

3. Replacement of dangerous electrical equipment and faulty ventilation systems—causes of most recent disasters—may be evaded through several exemptions.

4. Effective enforcement of the law is made difficult by complex provisions relating to inspections, appeals and postponement of orders.

Management would do well to so organize its operations to exceed the actual provisions of the law. Progressive mine operators will do so voluntarily; others should be forced by public opinion to provide better than adequate safeguards against the horrible aspects of mine disasters. H.A.

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(For further details, use the Reader's Inquiry Card on page 75)

by Watchful Dan The Safety Man

Do Bigger Accident Scores Mean You're Making Progress?

Happened to see a monthly plant report the other day on eye accidents. The tabulation looked like this:

Flash	1
Chemical and other burns	2
Contusion, laceration, etc.	1
Foreign body	16
Total	20

Reminds us of the old argument between the safety engineer on one hand who hits the ceiling when he sees a high incident of first aid treatment, vs. the safety guy on the other hand who *loves* it.

How many of the foreign body accidents in the above box score were "trifling?" That total might have been held down to 4 or 5 if all those workers in the foreign body category hadn't been such worry-warts, one might say.

Personally, we believe in high accident scores—but not just to keep the nurses busy (altho that's what they're there for). Ask the doctor at your place just how "trifling" a speck of dust in the eye can grow to be if not attended professionally.

Every time a worker goes to first aid he's asked how the accident happened. It can't help but encourage more conscientious use of safety eyewear. And *that* can't help but reduce the carelessness that causes 98% of our industrial accidents.

-Dan

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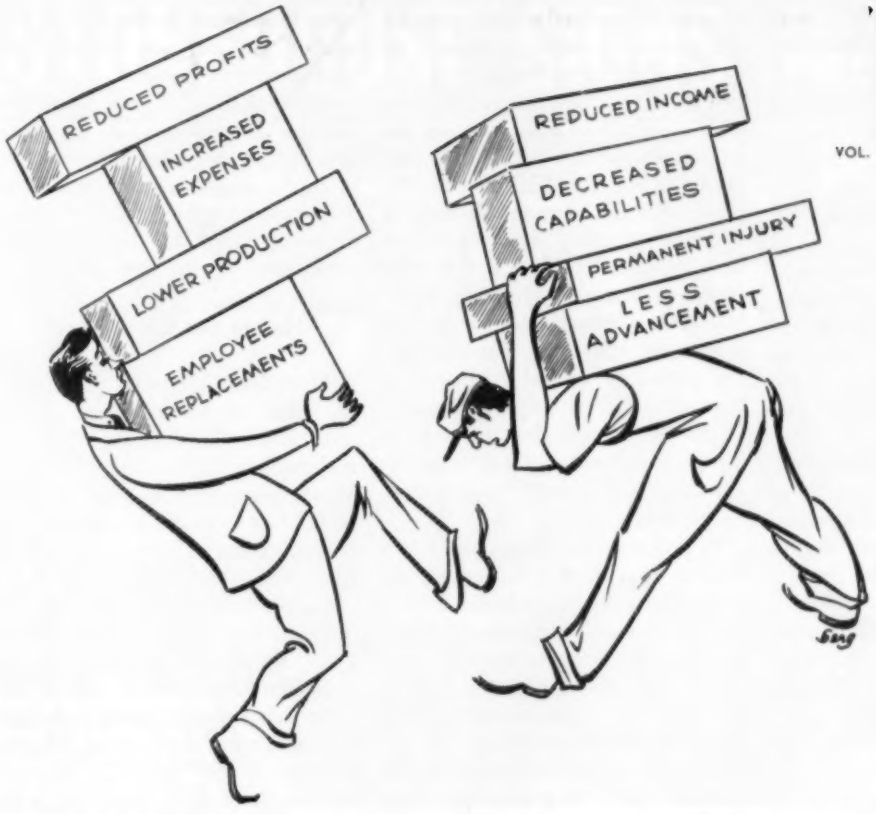

To reduce the heavy burdens of accident costs borne by both management and the worker, do not overlook the important role the medical department can play in promoting safety.

Maintaining Interest in Safety

By C. RICHARD WALMER, M.D.
Managing Director
Industrial Hygiene Foundation
Mellon Institute, Pittsburgh, Pa.

WE ALL take the blessings of health and well-being too much for granted. Furthermore, the misfortunes of sickness and injury, like all unpleasant things, are easily put aside in our everyday thinking. The problem of maintaining worker-interest in a health and safety program, without resorting to continuous nagging, is a difficult one to solve. It requires a good deal of originality, and tireless effort on the part of all those who are responsible for it in any organization. It requires, for example, the active support of *management* and of the *unions*, as well as the cooperation of the employees, themselves. This implies that maintaining interest in the program means maintaining the interest of management and of the unions as well as of the worker.

All of the techniques for building and maintaining a sound program of safety and health are well-known. These techniques include, of course, individual training of the worker, beginning with his indoctrination at the time of employment, and continuing "on-the-job" instruction in safety; safety meetings; bulletin boards and posters; articles in the house organ, and the union newspaper.

Many have utilized the technique of competition between departments or plants in achieving the lowest accident incidence. I believe, however, that many incentive programs in which the group with the best accident record for the preceding period is rewarded with the gift of a watch, or bond, or a turkey at Christmas, fail to achieve their primary objective. Attention becomes focused on the watch or bond, or whatever is awarded to the extent that the competing teams actually lose sight of the fact that they are striving for safety. In other instances, within my knowledge, the accident record becomes so im-

portant that any injury which may seem sufficiently slight to be safely covered up is not reported, consequently goes untreated, and later results in a serious disability with a great deal of lost time.

Counseling Opportunities

Important among these techniques is that of personal, individual, counseling which can be carried out to excellent advantage in the first-aid or medical department. Each physical examination—whether preplacement or periodic—each dressing of a minor injury—each consultation with the nurse or doctor in matters of health and personal hygiene, offers an excellent opportunity for maintaining the interest of the individual worker in health and in safety. Almost without his knowing it, he can be impressed with the importance of wearing protective equipment or with the necessity for obtaining prompt medical care for every minor injury.

There are innumerable instances in which routine physical examination has disclosed a slight physical defect or disease condition at a stage in which it could be readily cured or corrected, and the intelligent workman realizes immediately that he has been spared the consequences of a clinically-advanced condition. How can an employee whose physical examination discloses an incipient diabetes fail to appreciate the value of a health and safety program, particularly if he has seen among his relatives or acquaintances someone who was less fortunate and perhaps developed gangrene because the disease was not found in time?

Personal Factors in Accidents

It is impossible to overemphasize the help that a well-functioning medical department can give in the matter of detecting the cause of accidents, especially that large percentage in which a personal factor is responsible. The discovery of chronic illness or of a lowered efficiency from fatigue or any of a number of personal reasons may be the clue to accident proneness in an individual or to the cause of any one accident. These personal factors, such as illness of a member of the employee's immediate family, concern over matters of his own health, poor nutrition, etc., are all matters which the medical department can detect and correct. It is well to take heed of nature's warning signs, which can conceivably result in permanent afflictions. For example, the pathology behind gradual diminution of the eye may not lie within the eye itself, but may be a symptom of some other systemic condition such as hypertension, even kidney pathology.

In personal consultations with the victims of accidents, especially repeaters, one should make the worker feel that there is a personal interest in *his* well-being and that management's concern over his accident is not just one of profits and cutting down on manpower hours lost. He should be shown that any effort to prevent injury to him is primarily for his own good.

Find the Accident Cause

In connection with the visits to the plant medical department, there is another very important aspect of safety training. In most companies, the employee is required to give the nurse or physician a statement as to the cause of the accident which resulted in his injury. Properly taken, this statement can be of tremendous value in impressing him with the *actual* cause, and with the need for safer work-habits in the future. If, for example, instead of simply accepting the statement, "a piece of dust flew in my eye while I was working," the patient were required to be more explicit, and give a history something like this: "While I was digging with a pick and not using my goggles, a piece of stone flew into my eye," he would immediately be aware that his personal behavior had contributed in no small way to his injury.

Conversely, in those instances in which the accident was *not* due to some dereliction on the part of the worker (if we may admit that occasionally an accident is not the worker's fault!) he may contribute valuable suggestions in improvement of machine design, guards, or methods, and these should be immediately brought to the attention of management and *just as quickly* acted upon by management.

How to Get Cooperation

There is an important psychological facet to be considered when medical examinations are offered to the employees on a voluntary basis. Workers are often reluctant to avail themselves of such annual or periodic examinations because they fear that their jobs would be jeopardized if certain physical defects were discovered. Such a program should be preceded by a campaign to educate the men to the value of periodic health examinations and a full explanation as to the purpose of the program. Medical examinations in a company with which I was connected were made available to the workmen, but a very small percentage took advantage of the offer at first. It was soon discovered that the reason for their reluctance was that they were afraid that anyone found to have a physical defect might lose his job or be the first to be laid off when conditions required. In this instance, the physicians, albeit belatedly, held conferences with the shop stewards and explained the advantages to the employees of such a health audit. It was explained that results would be sent to the family physician and that except in cases where the job was incompatible with the worker's physical condition, the work status would not be affected. The actual dollar value of the examination to the individual was a matter of great interest to the union representatives, by the way.

Many companies increasingly are recognizing their investment in their executive group and are offering annual physical examinations, including quite extensive laboratory work, to all men *(To page 61)*

STONEHOUSE SIGNS For ACCIDENT PREVENTION

CAUTION
DO NOT ENTER WHILE MACHINERY - IN MOTION -
SHUT DOWN THIS MACHINE BEFORE CLEANING, OILING OR REPAIRING
WAIT UNTIL ALL MOVING PARTS STOP
DANGER
HANDS OFF
NOTICE
THIS ELEVATOR IS FOR FREIGHT ONLY NOT FOR PASSENGERS

Men and Machines

Whether processes involve great batteries of complicated machinery or more simple operations, there are always hazards on the job.

For while modern machines are marvels of efficiency, men and women have to operate them, for machines cannot think.

STONEHOUSE SIGNS

...teach workers to be more careful around machinery; warn them against hazards; and stress the importance of thinking and working safely, to avoid accidents.

Stonehouse complete Catalog features hundreds of different stock-worded Accident Prevention signs. It's free. Special wordings also produced to your specifications.

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DO NOT START THIS MACHINE
SAFETY FIRST
DO NOT OIL OR CLEAN MACHINERY WHILE IN MOTION
CAUTION
DO NOT OPERATE THIS MACHINE WITHOUT GUARDS IN PLACE
DANGER
THIS MOTOR STARTS BY REMOTE CONTROL

Stonehouse

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"Signs Since 1863"

ACCIDENT PREVENTION • *steel* SIGNS IN STANDARD COLORS AND DESIGNS

(For further details on advertised products, use the Readers Inquiry Card on page 75)

WHAT YOU

For detailed descriptions of first aid products, see pages 243–261 of "Best's Safety & Maintenance Directory" 1952–1953 Edition.

The scenes shown here are highlights from the new film, "Target: U.S.A.", a twenty-minute documentary based on studies by the National Security Resources Board with the assistance of the Department of Defense.

Top: What to do in case of atomic attack is all-important, and there is little time to find out after it happens. The bulletin board keeps personnel informed of developments and of procedures applicable to the plant.

Second: Here departmental representatives go into a huddle with the chief warden to evolve the plant-wide defense program in all its details. By such meetings, someone in every part of the plant will know exactly what is to be done at a time of emergency.

Third: The result is a prompt, but quiet and orderly procession to the designated shelter area. Indoor shelters like this will protect against flash burns, a major atomic hazard.

Fourth: A vital part of the master plan is a first aid room with proper equipment and personnel. Here the physician is applying a sterile petrolatum gauze bandage to an employee's burned arm. First aid workers are being widely trained to render simple first aid until the doctor arrives and takes over.

FEATURE

This is the third of three feature articles on First Aid. The first two articles, dealing with resuscitation and a new type bandage, appeared respectively in the June and July issues of SAFETY MAINTENANCE & PRODUCTION.

SHOULD KNOW ABOUT BURNS

In planning for Civil Defense and Industrial Disaster Programs, everyone should have a basic knowledge of the first aid treatment of burns.

YOU should know something about burns, because burns are something that could happen to you or the man next to you. Knowing what to do when someone is burned may save a life. Such knowledge will become even more important if, what everyone hopes won't happen nevertheless does, an atomic attack occurs. In that tragic event, burns will claim far more victims than radioactivity. Of every five casualties at Hiroshima, four were caused by burns.

Fortunately, if prompt and proper treatment is given, a bad burn is no longer as grim a killer as it used to be.

Only a few years ago, a burn injury covering half the body surface, often less, was always fatal. This fatal margin varied with age and area of the body. Children are more susceptible than grownups. The most dangerous burns are those on the face and, strange to say, on the seat.

Today, thanks to medicine's amazing progress, patients who were burned over as much as 80 percent of their bodies are walking around with a healthy respect for fire. For this there are two reasons:

1. They were hurried to a hospital, where treatment based on the latest medical research, was set in motion at once.

2. The first aid they received before getting there helped rather than hindered the physician.

Causes of Burns

The best way to treat burns, of course, is to avoid them. Here are the eight most common causes of burns: (1) catching fire from stoves and grates, or being trapped in a burning building; (2) lighting fires with kerosene; (3) cleaning clothes with flammable liquids; (4) using matches and cigarettes in bed; (5) fireworks and bonfires; (6) hot fats and metals; (7) chemicals; (8) electricity. Children all too often are scalded by pulling hot liquids from stoves. A spark, a flash, a hot surface can cause a burn. So can too much sun. What vacationer doesn't know it?

The second line of defense, if caution fails or the enemy breaks through, is preparedness. Personnel, by the millions, in industry and civil defense, are seeing the new film, "Target, U. S. A.," and hearing the message of plant-wide defense and first-aid stations.

"Modern air power makes us as vulnerable today as London was in World War II," says Military Analyst Hanson W. Baldwin in the film commentary. "The need is for intelligent basic planning on which to build a civil defense program at the industrial plant level."

Peace or war, it's important to know about burns . . . and just as important to know what *not* to do as to know what to do.

Nature of Burns

A bad burn is an open wound. It is liable to infection. It is a point of leakage for vital body fluids. It is a trigger mechanism that may send the patient into a dangerous state of "shock."

A first degree burn reddens the skin. A second degree burn raises blisters. A third degree burn chars the flesh. Even a first degree burn over a large skin area can be serious.

The patient should be rushed to the hospital, if there is any question at all about the seriousness of the injury. It is better to be over-cautious than sorry.

Except for first aid, the treatment of burns should be left to the physician at the hospital, where he has supplies, equipment, and a team of skilled assistants at his elbow, to say nothing of a lot of highly technical knowledge in his head.

First Aid Treatment

The essential purpose of first aid is to seal off the burned area promptly. It should not be touched, breathed on, or left exposed to the air—for in these ways germ infections may be introduced.

If the burn occurs with no trained personnel on hand, the doctor will prefer that you use only a dry, sterile, fine-meshed gauze bandage. Cover the damaged surface and an area two inches beyond, applying the bandage securely but not tightly. A first degree burn that is not extensive may be covered with sterile petrolatum gauze.

The covering relieves the pain, safeguards the wound against infection, and discourages tampering until the physician can make an examination and determine the treatment he prefers.

Usually the doctor will apply a complete "pressure dressing," using sterile petrolatum gauze for contact with the burned surface. This form of dressing has come into wide use since it was developed during World War II at the request of the Surgeon General of the Army.

Many industrial plants and other large establishments have nurses and first-aid workers who are specially trained to apply these pressure dressings or simpler, temporary contact dressings.

A primary purpose of the pressure dressing is to reduce the seepage of body fluids through the wound. Usually it is left in place six to fourteen days, as the attending doctor decides, unless infection develops. The contact film of bland petrolatum eases the pain and keeps the bandage from sticking. Being chemically inactive, the petrolatum is not absorbed into the system.

Don't try to help the burn victim by applying some "home remedy" that may once have been in vogue. The chemicals they contain may be absorbed into the system with harmful results. Neither should you open blisters or remove damaged blisters. Don't even try to cleanse the wound, for you are more apt to do harm than good. The best service you can render is to see that the burned area is properly covered.

Serious Burns

When a patient is burned over a large part of the body, for instance because his clothing caught fire, it is not feasible to try to dress his wounds. Don't remove clothing, either. Just throw a clean bed sheet or freshly laundered towels over him and get him off to the hospital. The same applies to wounds of the face. They are difficult to dress and are particularly liable to involve the danger of shock.

After this initial protection, it's up to the doctor. A severe burn demands "total body treatment." The patient must be kept from passing into shock, or pulled out of it if he does. He will need blood plasma and massive transfusions of whole blood, besides sodium salts, to restore the circulating volume and the body's fluid balance. He may need three times as much protein in his diet as he would normally eat, to make up for what is lost, and part of this may have to be given by vein instead of by mouth.

These needs are measured by careful and constant laboratory tests. All this while, the doctor will be on the alert for any signs of infection, so that he may combat it with penicillin or other antibiotics. His final task is to see that the wound is properly closed, perhaps making use of skin grafts to prevent or reduce disfigurement.

Clearly the job is a big one. Many hospitals are organizing "burn teams" of medical and nursing personnel, so that the physician in charge can keep every detail under control around the clock. Boston's 1942 Cocoanut Grove fire was one of the most tragic in history. But out of this experience, "Total Body Treatment" of burns hit its stride—and now medical science is chalking up another victory.

Many Are Burned

Every year, Uncle Sam's figures show, some 8,000 Americans perish from accidental burns and conflagrations. Five or ten times that many are severely burned and live. Some of these are under hospital care for weeks and months. For all the miracles of skin grafting and plastic surgery, disfigurement cannot always be entirely avoided.

With variations depending on the area, an adult with 15 percent of his body burned, or a child with 8 percent, may go into shock. More serious burns, if untreated or improperly treated, can end in death.

So always seek expert attention at once in case of a serious burn. And here is a worth-while parting thought: Repeated blood transfusions, sometimes a score or more, are a major element in the burn patient's recovery. It is of prime importance that the American Red Cross receive plenty of blood donations to meet these heavy demands. By being a regular blood donor yourself, you are taking out insurance against the time when your own life may depend on an unfailing supply of this precious fluid.

Pictures by courtesy of Chesebrough Mfg. Co., Cons'd.

No. 1 of a series of 6

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Water Spray

THE PROBLEM

Left: Explosion of unsprayed LPG tanks at Newark, N. J., created flames with temperatures of 3,500 degrees F.

Below: Oxygen content of the air is not sufficient to burn the concentration of exploded LPG near ground. Carbon-black soot rises 8,000 feet.

The extensive and costly damage caused by liquefied petroleum gas explosions and fires has underscored the need for adequate protection of storage facilities for this widely used fuel.

By DAWSON POWELL
Technical Editor
Grinnell Company, Inc.
Providence, R. I.

LIQUEFIED petroleum gas is potential flame, compressed and ready to erupt.

Solid or liquid fuels that are heavier than kerosene require a period of preheating or mechanical vaporization before they produce volatile gases that will burn as flame. Advantage can be taken of this necessary preheating period in keeping them in a safe condition and in extinguishing them once they have caught fire.

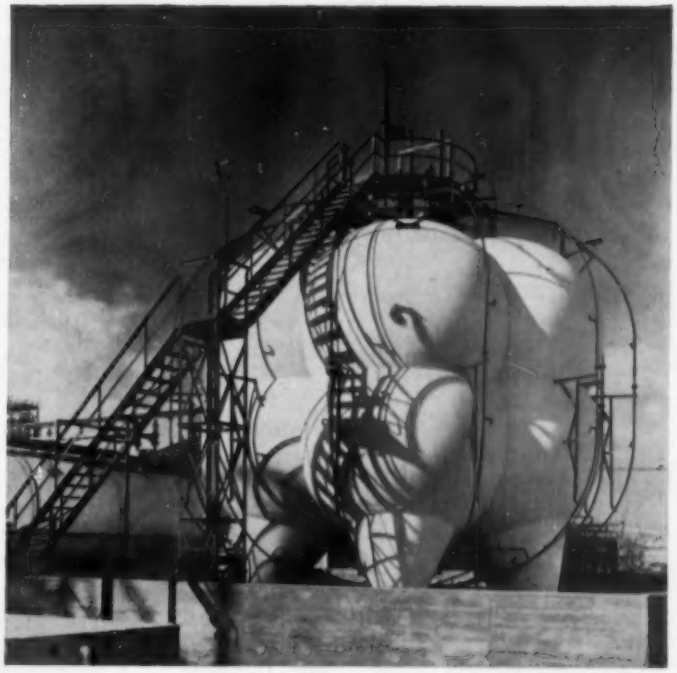
This is not true of LPG. This gas remains liquid only because of the pressures and temperatures under which it is stored. It will boil at minus 45°F. When it leaks into the surrounding air it becomes explosive as soon as there are 2.37 parts of propane gas per hundred parts of gas-air mixture. When there are more than 9.5 parts of gas in each hundred parts of gas-air mixture, it again becomes temporarily safe. If it is not ignited it may drift away, mixing with the surrounding free air. This mixing with more free air brings it again within its explosive range between 2.37 to 9.5 parts of gas per hundred parts of gas-air mixture. Once ignited, remote from the source of

For detailed descriptions of fire extinguishing systems, see pages 51–69 of "Best's Safety & Maintenance Directory" 1952–1953 edition.

Keeps LPG Storage a Good Neighbor

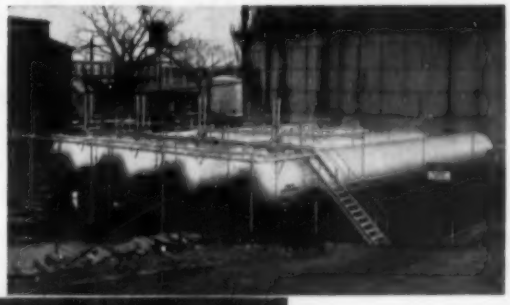
the leak, the flame will follow back to the source of fuel at the leak like fire in a fuse or along a powder train. In the case of propane, the flame travels at the rate of about five yards a second.

Liquefied petroleum gas is heavier than air. Spilled out it sinks to the ground and tends to flow into any depressions, drains or other openings in the ground. It does not diffuse into the surrounding air as rapidly as air mixes with other air, diffusing at a rate only 82 percent as fast as air. Thus its spontaneous mixing with air to produce explosive proportions in a gas-air mixture may appear somewhat sluggish. Once mixed in the correct propor-



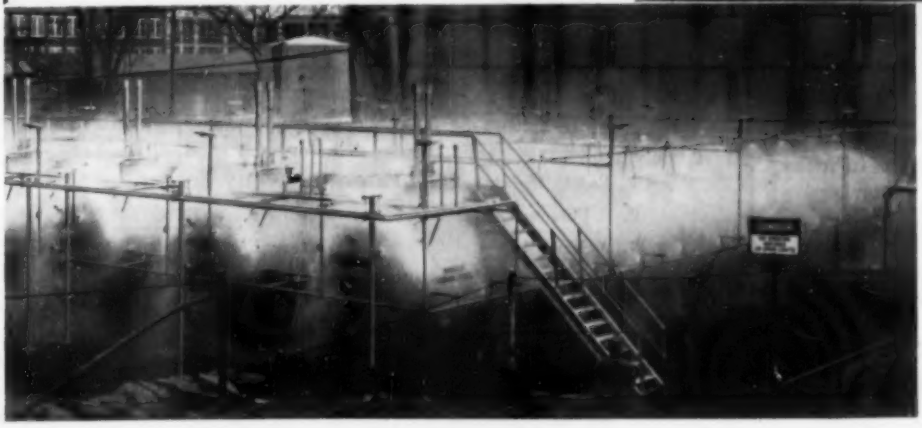
THE ANSWER

Protective spray nozzles stand ready to insulate this 2,500 bbl. multisphere and highly flammable contents against heat.



Right: Four LPG storage tanks with water-spray piping and spray nozzles in place to assure their remaining "good neighbors."

Below: This test run of the water spray equipment demonstrates the every-square-inch coverage necessary to avoid soot spots.



tions, its explosive violence is in no way diminished.

We have briefly sketched the characteristics of propane, a frequent constituent of liquefied petroleum gas. Considering its performances at Newark, New Jersey, in Florida, Louisiana, Oklahoma, South Carolina and Massachusetts, it would appear to be safer to leave LPG in the ground. But though its behavior when insufficiently controlled or improperly protected can be disastrous, it has so many counterbalancing virtues as an abundant and inexpensive fuel that it is fast becoming a next-door-neighbor to all of us who live in cities supplied with natural gas and to country and resort dwellers who use it as "bottled gas."

Spread of the Hazard

The LPG storage hazard comes to cities and towns when a local industry or the gas company starts using LPG as a regular fuel, as a standby fuel during interruptions in the supply of natural gas, or as an enricher for manufactured gas supplied to homes and industry. Where the local gas company is regularly distributing natural gas to its customers, it usually puts in LPG storage to supplement its natural gas supply around breakfast and supper times, when all customers want to cook at the same time. The rate the gas company pays to the gas-line transmission company is based upon the demand at the hours of peak consumption. If peak demand for natural gas can be reduced by supplementing the natural gas with liquefied petroleum gas during peak load hours, the gas company can buy its natural gas from the gas transmission company at a lower rate and make a better profit on the gas it resells to householders. In many ways LPG is both a better and a cheaper fuel.

Responsibility for "Safe" LPG Storage

Fire Chiefs, Fire Marshals and other officials charged with protecting the lives and property of the community face the responsibility of deciding what safety protection shall be required wherever the LPG storage hazard is introduced into a community. Among the standard recommendations for such protection, "Water Spray" is most frequently mentioned. For this reason it is wise to consider what benefits water spray and water spray alone can give, before agreeing to accept some form of protection which is represented as being "almost as good."

LPG storage can be a good neighbor just so long as it remains under control. It is usually stored at up to 125 pounds per square inch pressure. If leakage occurs, it may come forth either in liquid or gas form. At temperatures above minus 45°F, each gallon of liquid vaporizes to form 35.80 cubic feet of propane gas. This vaporization is a gradual process because heat is required to bring it about. In the absence of fire this heat is obtained from the ground and from the air, and the rate of heat flow from the ground and air determines the rate of vaporization. Vaporization is accelerated by any wind, for air movement brings with it fresh air and a replenished source of heat. Water, either as a solid stream or spray, supplies enough heat to speed vaporization. As a spray, water also supplies the turbulence needed to speed dilution of the gas by the nitrogen and inert gases in air.

Advantages of Fixed Water Spray

Liquefied petroleum gas after vaporization exists in one or more of *three* conditions when mixed with oxygen from the air: (1) too rich to burn and therefore temporarily safe; (2) within its explosive or flammable limits, needing only ignition to explode or burn; and (3) too lean to burn, and therefore safe to dissipate into the surrounding atmosphere. When any spillage of LPG in its liquid form or any leakage of it in its gaseous form occurs, it is necessary for the gas to pass through the first two conditions before it is safe to dissipate it into the surrounding atmosphere.

When leakage is discovered, the fixed water spray system should be turned on immediately. The application of water spray to the storage tanks and adjacent piping assists in maintaining safety in the following ways:

1. It cools the tanks, thereby reducing the vapor pressure within the tanks, thus slowing down the discharge through the leak. It also provides protection *(To page 56)*

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FOR AUGUST, 1952

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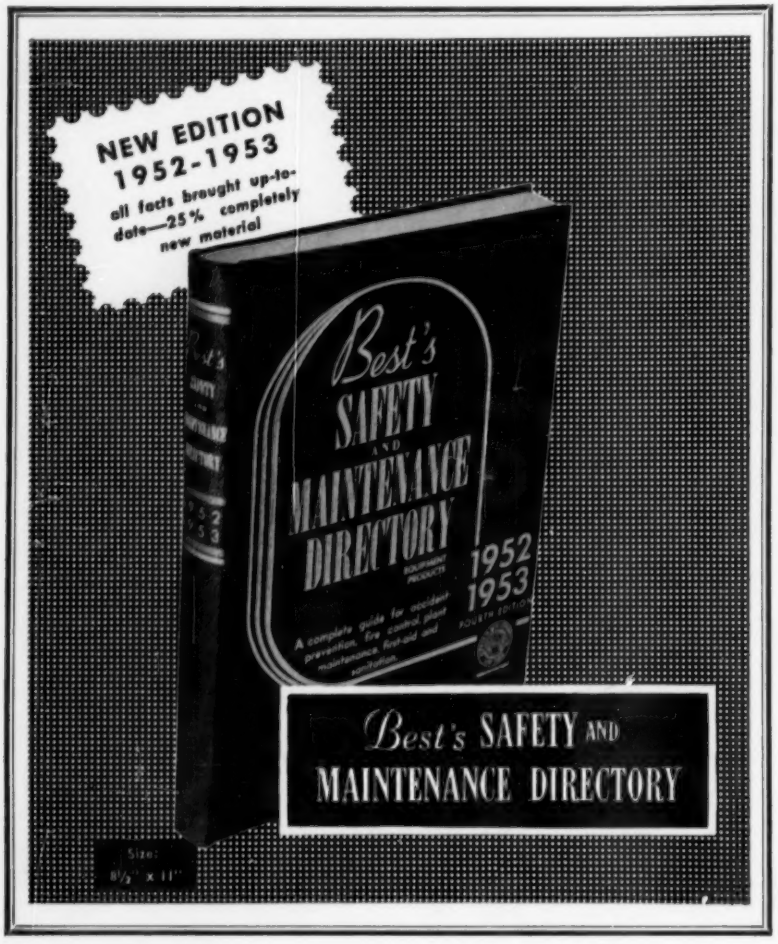

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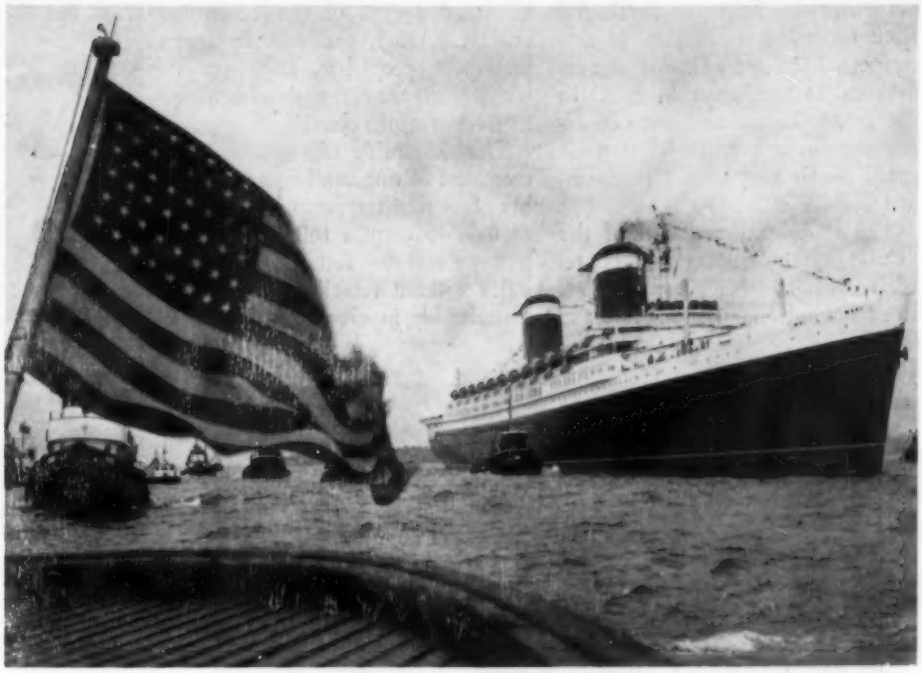


New York World Telegram & Sun Photo by Ravenna.

Luxury Liner Dressed for Safety

S. S. "United States" sweeps the seas as last word in accident and fire protection.

By HARRY ARMAND

Luxury plus safety. This view of the Ballroom on the "United States" shows the use of aluminum furniture frames, fire-resistant fabrics and fire-retardant paints. These features are typical of the safety in the ship's design and furnishings.

REGALLY escorted by destroyers and Navy blimps, Uncle Sam's new ocean queen, the superliner "United States" made her triumphant entry into New York harbor in the longest, noisiest and most spectacular maritime welcome ever accorded a monarch of the seas.

Honored by fire boats spraying geysers of white plumes high into the air with an accompaniment of an ear-splitting cacophony of whistles, the majestic liner paraded slowly up the river in a royal procession worthy of a queen going to her coronation.

As the colossal black and white hull topped by giant red, white and blue stacks came into view, thousands of spectators on New York's waterfront paid tribute to the liner with a tremendous roar while an

avalanche of ticker tape was released from the windows of pierside skyscrapers. Flags and welcome banners fluttered in the breeze in salute to the safest, fastest and most modern superliner ever built to wrest speed laurels away from foreign vessels.

The top speed potential of the "United States" never will be revealed. Built to Navy specifications to outrun any enemy submarine, the $75,000,000 gem of the ocean is pushed through the seas by four mammoth propellers, any two of which can keep the ship moving in time of world conflict.

The new pride of the country's merchant marine can be stripped of her glamorous trappings in a matter of days to carry a full division of troops a non-stop distance of 10,000 miles without refueling at a speed considerably in excess of 30 knots.

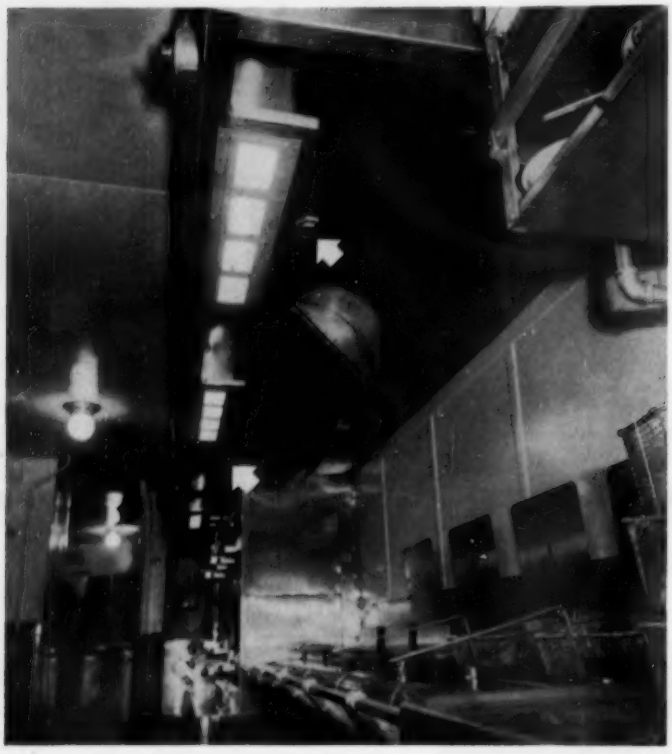
Automatic heat fire-detecting and carbon dioxide fire extinguishing system guards one of the electrical equipment stations.

As the nation's last word in passenger-carrying vessels, she has broken all speed records for her owners and operators, the U. S. Lines.

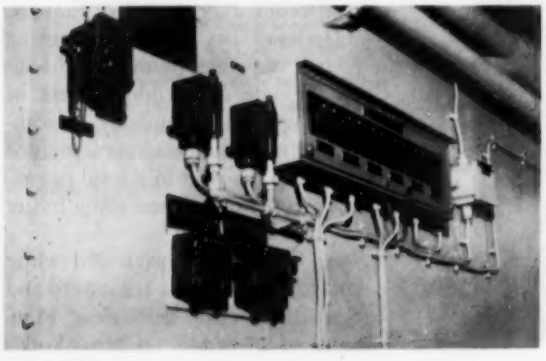
A Dream of Safety

The "United States" represents a dream of safety and fireproof perfection. In fact if any superstitious passenger wishes to knock on wood, he must bring the wood aboard. Hand rails, life boats, furniture and deck chairs are of fireproof aluminum; interior decorations are executed in spun glass, metal and plastics. Even the decks have been covered with top-secret non-flammable material rather than the teakwood traditionally associated with the decks of passenger liners.

According to William F. Gibbs, internationally known naval archi-



Heat fire detectors and carbon dioxide fire extinguishing discharge nozzles installed inside galley range hoods. Carbon dioxide protects the superliner's exhaust ducts, galley ranges, deep fat fryers, and range hoods from fire.



One of the remote control panels for operating manual carbon dioxide fire extinguishing system protecting ship's vital areas.

The manual carbon dioxide fire extinguishing system that protects one of the emergency generator rooms against fire.

COOL HEADS IN "HOT SPOTS" WON'T LET YOU DOWN

On jobs where the air is foul or hot, men can't be blamed too much for letting up now and then. If you want to keep their efficiency and morale high, feed them better air.

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Give some thought now to the "hot spots" in your plant. There is a Coppus Blower for practically any requirement — Cable Manhole and Tank Ventilators, Boiler Manhole Blowers and Exhausters, Heat Killers, Shiphold Ventilators, etc. The Coppus "Blue Ribbon" is your assurance of design and construction planned for plenty of severe service. Check and mail the coupon for specific information. Coppus Engineering Corp., Worcester 2, Mass. Sales Offices in THOMAS' REGISTER. Other "Blue Ribbon" Products in BEST'S SAFETY DIRECTORY, CHEMICAL ENGINEERING CATALOG, REFINERY CATALOG.

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- ☐ exhausters, welding fumes.
- ☐ stirring up stagnant air wherever men are working or material is drying.

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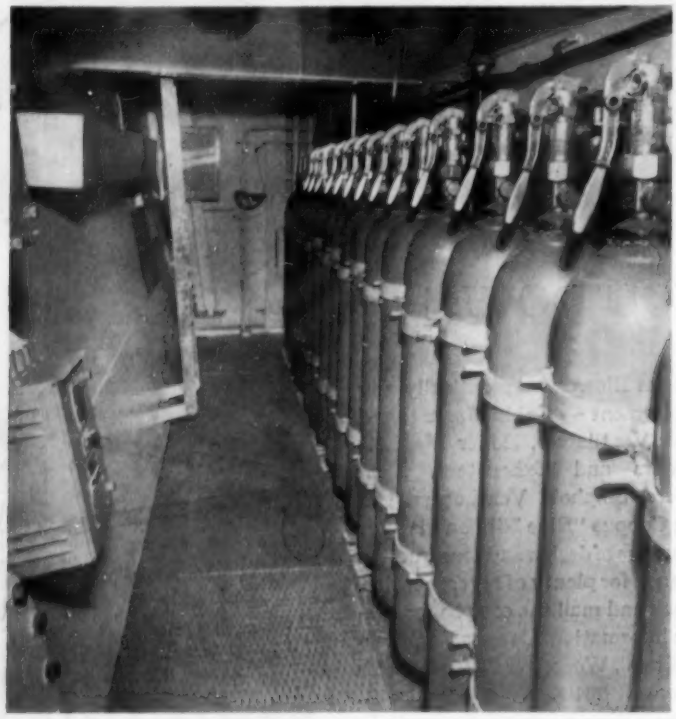
(Write here any special ventilating problem you may have.)

(For further details, use the Reader's Inquiry Card on page 75)

tect whose firm designed our First Lady of the Seas, the "United States" has not only the utilities of a small city but can ride all stresses of sea and wind as a self-contained community of 3,000 persons.

The superstructure is virtually one large installation of "seagoing" aluminum whose ability to resist salt water corrosion has been shown in exhaustive tests. The surface of all exposed, bare aluminum has been anodized. Further basic strength was built into the interior hull by installing more watertight compartments or metal walls across the ship than any other passenger ship possesses. Openings between such compartments have steel doors which can be sealed automatically and electrically as well as by hand gear.



Part of the large banks of carbon dioxide cylinders and controls for the manual carbon dioxide fire extinguishing system protecting various vital areas from fire.

American Know-How

In all its overall characteristics the "United States" is the safest ship that American know-how could build. Her hull is in the form of a double "skin."

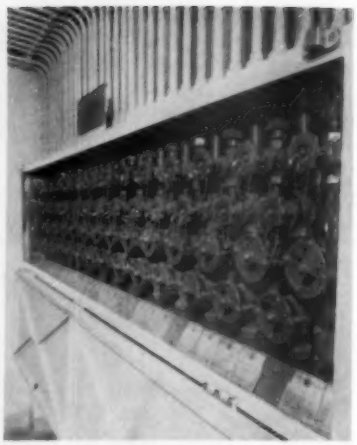
Long in advance of its launching, safety and fire protection were planned and built into our greatest superliner. In addition to such obvious protective features as anti-slip floor surfaces, stair treads, flameproof fabrics, fire retardant paint and non-combustible furnishings, other safeguards built into the ship cannot be divulged since that information would be of vital importance to an enemy bent upon destruction of a carrier capable of transporting 14,000 soldiers and their equipment. Health and well-being of both passengers and crew is assured by complete, 100% air conditioning throughout the ship.

The new liner raises safety to its pinnacle in a new departure for merchant ships—a damage control center in which all the controls, equipment, annunciators and means of communication for complete safety are centralized. This station issues reports and orders on a round-the-clock schedule.

Ultimate in Fire Control

Fire protection standards of the new sea-going monarch have been raised to an unprecedented degree under the direction of the Navy working with the world's greatest experts in fire control.

Below decks all partitions and paneling are made of a special asbestos wall board of which a half million square feet have been used to guard against the *(To page 54)*



Control valve cabinet containing air shut-off valves and carbon dioxide directional valves of combination smoke fire detecting and carbon dioxide extinguishing system for storage areas on S. S. United States.

Audible and visual smoke detector located in wheelhouse. The panel quickly and automatically shows any trace of smoke, smoldering or fire in the ship's storage areas.

AIR CONTROL VITAL TO NEW LABORATORIES

Medical research requires the most carefully controlled working conditions. The new Sharp & Dohme Research Laboratories provide complete ventilation facilities for both safety and research.

MORE than 1000 distinguished scientists, doctors, business leaders and other guests were present when the new $4,000,000 Sharp & Dohme Medical Research Laboratories in West Point, Pa., were dedicated to the service of the medical and allied professions and the nation's health.

As a part of the program, a symposium on "Frontiers of Research on Blood and Plasma Extenders" was presented with a panel of six of the nation's leading scientists in this field of medicine.

Dr. I. S. Ravdin, of the University of Pennsylvania School of Medicine, was moderator. Members of the panel were Dr. Carl W. Walter, Dr. Charles A. Janeway, and Dr. Charles S. Davidson, all of the Harvard Medical School; Dr. Douglas M. Surgenor, Harvard University; Lt. Col. Edwin J. Pulaski, Deputy Director, Division of Surgery, Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington, D. C.; and Dr. Robert B. Pennell, Sharp & Dohme.

The ceremonies were held on the grounds of the company's West Point plant, which is located on a 200-acre tract about 25 miles northwest of Philadelphia.

A luncheon followed the morning ceremonies and in the afternoon guests inspected the new research laboratories which incorporate the latest concepts of design and construction and contain the most modern research equipment.

Construction of the new Sharp and Dohme Medical Research Laboratories at West Point, Pa., was started in September 1949, and the Research Medical and Patent Division staffs completed occupancy of the building in December, 1951.

Safety Features

The Pilot Laboratory, a separate, smaller building, has been erected directly behind the main Research Building to provide facilities for large scale research experiments. Since operations in this building

Preparing culture media in jacketed tanks for research use in the Microbiology and Immunology Section. Culture media are used in many research departments for growing microorganisms.

Screening for new antibiotics. Researchers in the new Sharp & Dohme Medical Research Laboratories are seen testing for the spectrum of antibacterial activity of experimental antibiotics.

will involve the use of large quantities of combustible solvents, all fixed installations are explosion-proof. This building contains about 6,000 square feet of floor space. It has a high center section flanked by testing laboratories with lower ceilings. A full range of service lines is provided so that installation of tanks, stills, mechanical and other equipment can be readily accomplished.

All large research equipment (larger than "bench-top") and anything which involves an explosion hazard is located in the Pilot Laboratory. Thus, in the Research Building, the heavy construction needed to support large tests has been minimized.

Research Building

The new four-story Research Building has been laid out in an "L" shape with the north wing 283 feet long by 64 feet wide, and the west wing 122 feet long by 64 feet wide. The laboratories contain approximately 110,000 square feet of floor space. As the site selected is gently sloped, the main entrance is on the second floor at the highest ground level. This allows for full light and ventilation for all laboratories including those on the down hill side of the first floor.

Structural materials are steel and concrete; exterior walls are colonial red brick in a full range of colors with limestone base and bands. The entrance portico is two stories high with limestone columns giving it a colonial character.

All exterior metal work, such as railing and grilles, is aluminum. Large, double-hung aluminum windows are installed throughout the building.

For the convenience of employees, the third floor of the building is connected by a bridge across a road to the Cafeteria in the main Warehouse Building.

A truck-height loading platform with an overhead canopy stretches between the main building and the Pilot Laboratory. This provides efficient and economical loading and unloading facilities, as well as a convenient and protected walkway between the two buildings. Part of the loading platform design is a

(Continued on page 35)

Exhaust hood in Organic Chemistry Dept. is used to perform the Kjeldahl digestion process, which is the first step in determining the purity of a material. Each exhaust hood in new research building has its own two-speed fan located in pent house of building. Fans are controlled at the site of the hoods for the convenience of scientists.

Observing operation of ultraviolet sterilization lamps in an air duct at the new Sharp & Dohme Medical Research Laboratories. Air passing through duct is substantially sterilized by exposure to ultraviolet radiant energy from these lamps. This unit, located in the pent house, services the air-conditioned areas of the Department of Bacteriology.

In the Organic Chemistry Department a laboratory assistant weighs an antibiotic sample in a gloved dry box. All the necessary manipulations and transfers in weighing samples can be carried out with the aid of gloves sealed into the box. Very dry filtered air is supplied to the box to prevent contamination of sensitive samples by moisture or dust.

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SMOKE FIRE
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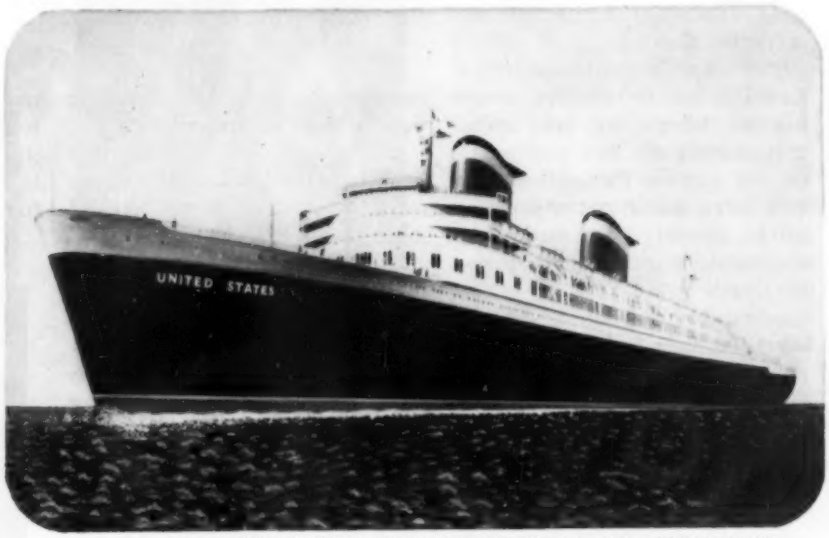

BUILT BY NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

The designers and builders of United States Lines' new flagship, the S. S. UNITED STATES, made every effort to make her not only the world's finest, but also the safest. That's why, in addition to providing structural fire protection, modern, quick-acting C-O-TWO Marine Fire Protection Equipment has been installed in such vital areas as boiler rooms, pump rooms, electrical equipment stations, cargo holds, store rooms, repair shops and galleys.

In any compartment fitted with C-O-TWO Smoke Fire Detecting, the first trace of smoke is drawn through piping to the smoke detector in the wheelhouse. Immediately an alarm sounds and the exact location of the fire can be determined by looking at the designated non-glare observation window in the smoke detector.

Through the use of direction valves, clean, non-conducting, non-damaging carbon dioxide gas is discharged into any C-O-TWO protected area afire . . . the fire is extinguished in seconds, before it spreads and causes extensive damage. The pressure-operated discharge is an original C-O-TWO development permitting manual release of the control cylinder together with simultaneous discharge of a pre-determined number of cylinders necessary to fully flood the threatened area with carbon dioxide gas. This eliminates the individual manual release of all cylinders, as well as insures a high concentration of fire killing carbon dioxide gas.

• • •

Whether your fire protection problem is a ship, factory, power station or research center, an expert C-O-TWO Fire Protection Engineer will gladly help you in planning fully approved firesafety now before fire strikes. Get the facts today!

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(For further details, use the Reader's Inquiry Card on page 75)

HOW TO USE LADDERS

Ladders can be servants or saboteurs—it's your decision which!

LET'S face it: whether or not your ladders are safe, useful tools depend on how you select, use and care for them. If you *do* apply a few simple precautions, you can be assured of greatest ladder safety and long service life. If you don't, well . . .

Select the Right Ladder for the Job

There is a ladder that is right for every job. Use it. Don't sacrifice safety for the false economy of "making that ladder do" for a job that requires a different design.

For example, don't attempt to use a household step ladder for tree trimming. The ladder is not designed for it: the legs are not intended to stand on uneven footing, nor can the ladder safely be leaned against a branch. Nor should you expect a standard ladder to carry extra heavy loads. Use a heavy-duty ladder. The load tolerances of ladders are close, and it is not hard to subject ladders to stresses above those allowed in design.

Many ladders are available that have been designed and built to meet the needs of certain types of jobs. Among these are Decorators' and Paperhangers' Ladders, Electricians' Ladders, Orchard Ladders, Platform Step Ladders, Heavy Duty Ladders, Step Stools, Window Cleaners' Ladders, and even ladders especially suited for use against shelves in store rooms.

The characteristics of a Safety Platform Step Ladder, for example, suit it particularly for use in industrial plants and in machinery maintenance. Rugged, well-braced construction assures adequate strength to support the repairman and his tools, and when necessary, an assistant may stand on the rung back in safety. The platform gives the man a stable standing area so that he may work conveniently in any direction with both hands free and without

Safety platform stepladders provide a platform for the workman. Also a tool rack at the top helps eliminate accidents from dropping of hammers, etc.

Extension ladders, like all other types, should be kept in good working condition at all times. Inspect the rope frequently and make certain that the automatic locks are also working properly.

For detailed descriptions of ladders & scaffolds see pages 384–399 Best's Safety & Maintenance Directory 1952–1953 Edition

SAFELY

By R. W. SCHNELLER

The Patent Scaffolding Co., Inc.

Long Island City, N. Y.

The extra heavy sides give much added strength to this type stepladder. Each step is truss-rodded and knee braced.

difficulty in maintaining his balance. The top of the ladder is slotted to hold the man's tools ready at hand, saving his time and preventing injury to those below by dropped tools.

Electricians have shown their preference for a different type of step ladder. It features high strength with medium weight for good portability. The material, of course, is non-conductive—wood. Steel tie rods, frequently found in the construction of stepladders, are eliminated in the electricians' design. Substantial knee and angular braces are substituted. Because the electrician often needs the aid of a helper, the sturdy rung back is designed to hold an extra man safely. Unnecessary features such as platforms or pail rests are not included. The Electrician's Ladder fills the needs of this job, yet does not put him to the expense of unneeded extras.

Electricians have found this type of ladder to be ideally suited to their work. Both the front and the back of the ladder can be used at the same time.

Years of experience have determined the particular characteristics required in ladders such as these, and the wise ladder user will take advantage of this experience to increase safety and speed operations by choosing the right ladder to use. Ask your supplier—he'll be glad to recommend the right one.

Use Ladders Properly

The first impulse, upon buying a new ladder, might be to test it to see if it's safe: to give it a crushing load . . . maybe even, if it's a single or extension ladder, support both ends and jump up and down on the middle . . . see if it can "take it." The ladder came through the torture without breaking? Does that mean it's a good, safe ladder—one to use anywhere without fear? Even if the ladder did come through your grueling test unbroken, you might have started a fracture, crack or compression failure that will get worse or may fail entirely when the ladder is next used, even with a normal load. Excess stresses and strains can be cumulative in effect, leading to dangerous, sudden breakage.

The right way to check your new ladder is to look at it. Inspect it carefully; that's why it is left unpainted. If your ladder meets the requirements of the *American Standards Association Safety Code for Wood Ladders*, it is designed to carry a concentrated load of 200 pounds when the load is centered on a rung midway between the side rails. Those are the maximum load conditions for which the ladder was designed, and if it meets design and manufacturing specifications, there is no real need to test it. It is safe under the above conditions.

New ladders should be examined before they are used to determine whether they meet the code qualifications of the American Standards Association, which, briefly stated, permit—but limit—an occasional sound knot not more than one-half inch in diameter and none on the narrow edge of the rails, pitch pockets not more than two inches long nor greater than one-half inch deep, checks not longer than six inches, grain not steeper than 1" in 12", and material that is otherwise free from such non-permissible de-

FEATURE

This is the first of three feature articles concerned with Ladders & Scaffolds. The next two articles of the series will be published in the September & October issues of SAFETY MAINTENANCE & PRODUCTION.

fects as compression failures, fractures of any sort, decayed or brashy wood usually determined by its lightness and lack of grain fiber, and excess gouging or splintering. Workmanship in a ladder reflects its quality: if hardware is carelessly attached, rivets not properly peened or headed over, your ladder is subject to failure as this is a weak link in its construction. Ladders also should be inspected periodically to determine whether defects have developed.

A safety factor does not exist in ladders that allows an overload of three or four times rated capacity. This should be kept in mind when placing and using ladders. Increasing the recommended distance of one-fourth of the extended length of the ladder from the perpendicular retaining wall, proportionately increases the strain to an alarming degree, thereby decreasing the safe load capacity of the ladder to a dangerous point. Or, if the 200 pound load on a properly placed ladder is located so that it is taken by one side rail, the stress is greater than that intended for the rail. If conditions make it necessary to put extra stresses such as these on a ladder, use a heavy-duty ladder or one with the side rails suitably reinforced.

Safety Rules

- Always inspect a ladder before using it.
- Correct ladder use requires that, as previously mentioned, the foot of the ladder be one quarter of its extended length out of perpendicular. If the base of a ladder is too far from the wall it is leaning against, excess strain is put on the ladder; if the base is too close, stability of the ladder is reduced.
- Both side rails should have secure footing to avoid slipping and to allow each rail to bear its share of the load. As an extra precaution against slipping, ladder feet of the proper type are recommended for single and extension ladders, or the ladder should be made secure by lashing to a firm support.
- Do not place ladders in front of doors that open in the direction of the ladder unless they are locked or blocked open.
- Good safety practice forbids placing ladders on boxes or other unstable bases to gain additional height.
- Always face a ladder when going up or down, and, if at all possible, keep both hands free for climbing.
- Do not use the top of an ordinary step ladder as a step.
- Never splice short ladders together to provide longer sections.
- Maintain sufficient overlap with extension ladders. Recommended minimum overlaps are: extension ladders up to and including 36′ long—3 feet overlap; over 36′ and including 48′ ladders—4 feet overlap; over 48′ and including 60′ ladders—5 feet overlap. Length of an extension ladder is the combined length of the sections.
- Use ladders for their intended purpose only—never as guys, skids, planks or platforms.
- Care should be taken when using ladder jacks that workmen do not pile material on the invitingly larger platform and thereby overload the ladder.

Give Ladders Proper Care

When ladders are maintained and cared for properly, they will give good service for many years. The long service life and maximum safety assured by proper care is well worth the small investment and time required.

- Inspect periodically for defects. Defective ladders should be withdrawn and marked "Do Not Use."
- New ladders can be treated with a non-swelling, penetrating, water-repellent preservative, preferably transparent. Then they may be painted, if desired, assuming that a careful inspection has been made of workmanship.
- Store ladders under shelter with good ventilation. Do not store near radiators, stoves or other places where they will be subjected to excess heat or moisture. Ladders should be supported in storage so they do not sag or warp and so that they are easily accessible for inspection.
- Ladders carried on vehicles should be fastened to avoid sag and damage in transport.
- Lubricate the locks and pulleys on extension ladders. Replace worn or frayed rope on extension ladders.
- Keep hardware fastened securely and moveable parts operating freely without binding.
- Keep tie rods in stepladders tight at all times.
- Do not let oil or grease accumulate on the rungs.

These suggestions have been made with wood ladders in mind. However, the recommendations for selection, the rules for use, and most of the items on care apply as well to metal ladders. But whatever sort of ladder you use, a little care in its selection, use and maintenance will pay magnificent dividends in safety, efficiency and long ladder life.

Pictures by courtesy of the Patent Scaffolding Co., Inc.

The Injury Picture

THE average injury-frequency rate for manufacturing industries declined 13 percent during the last 3 months of 1951—from 16.0 injuries per million man-hours to 13.9—according to preliminary reports received by the Department of Labor's Bureau of Labor Statistics.

In a comparison over the year, the fourth quarter 1951 average was about 8 percent below that for 1950. The preliminary reports indicate, however, that the annual average for 1951 will be approximately 15.3, or 4 percent above the 1950 average of 14.7. During the first 7 months of 1951 injury rates were consistently above those for the same period in 1950. The August average was the same for both years, but during the last 4 months the 1951 rates were below those for 1950. These findings indicate a definite leveling off of *(To page 47)*

JUST ONE MORE ACCIDENT?

Some accidents are more than just one more statistic. The circumstances of such accidents make one painfully aware of their tragic waste and the need for more resolute action in the cause of human conservation. This is the story of one such accident, and, unfortunately, it is a true story.

By FORREST K. VAN HORN

MAY we tell you the story of a boy—a very brave little boy? Many of us have perhaps seen the film, "Miracle in Paradise Valley," and possibly recall it as a story dealing with farm safety.

It told the story simply, without fanfare or any attempt to enlarge on the hazards to be found on a farm. It did not try to frighten you with gruesome pictures of accidents and their horrible consequences. Yet, somehow, that story reached out and touched all of us who saw the film so dramatically that we shall never forget its lesson. More important still, we were able to apply its lesson to our particular problem of accident prevention.

This, too, is a story of farm safety, but again it seems to be one of those stories so intense with drama, so bound up with all of our human emotions that it reaches far beyond the original tragedy to produce a lesson that will long be remembered.

It's a true story and a simple one, if such stories can be called simple. We might begin it by saying that there were two brothers, and then point out that the love of one brother for another is something that seldom makes itself manifest in outward emotions. These emotions, you see, are considered somewhat "sissy" in boys who are 11 and 14 years of age, as were the brothers in the story we are telling.

It's a story of a tractor, too. And it unfolds itself into a picture of these two boys riding on the tractor, for what purpose the news item did not say. We can well suppose that they were engaging in work which is usual for tractors on a farm—plowing a field in preparation for spring planting.

The elder of the boys was named Richard Dale Foreman, and he lived in Dustin, Oklahoma. The younger was his brother, Glendell, who was 11 years old.

As these boys went about the work of plowing the field, the tractor overturned, as tractors have

done before, for one reason or another. Mostly such accidents occur because the person driving the tractor has not had sufficient training to recognize the hazards with which he might be confronted in such an operation. It is entirely possible, of course, that in this case the tractor seat was overcrowded, with the two boys occupying it.

Whatever the reason, the tractor overturned, and, as tractors often will when they overturn, the driver, Richard, was pinned to the ground.

And again, as so often happens, the tractor caught fire because the gasoline began to spill out. The younger brother attempted to beat out the flames with his coat, but the older brother, recognizing the danger to his younger brother in the possibility that the gas tank would explode, warned his younger brother rather forcefully away.

A passing motorist stopped, and tried to jack up the tractor to release Richard, to no avail, for the flames soon became uncontrollable. Richard, who knew what was happening, asked his younger brother to kiss him goodbye, and perished in the flames before they were able to release him.

He never cried a single tear. His mind was too young to protest against the injustice of having to sacrifice his youth to a tragedy that he could not understand, that need never have happened. And he never once screamed out at the pain that must have been his, when the flames seared into his flesh. He was a brave little boy, and he was buried as one would bury a hero—tenderly, in reverence, with a deep sense of loss, and perhaps in wonder at the fact that one so young could exhibit such manly courage.

There's seldom much to tell in these tragedies, and that's all there is to the story of Richard Dale Foreman. He's dead, at an age when his whole life was still before him; and we shall never know what that boy might have been had he been permitted to live his full span of years. We can only wonder just how far the manly courage that burned in his breast might have carried him in life, had this tragedy not occurred.

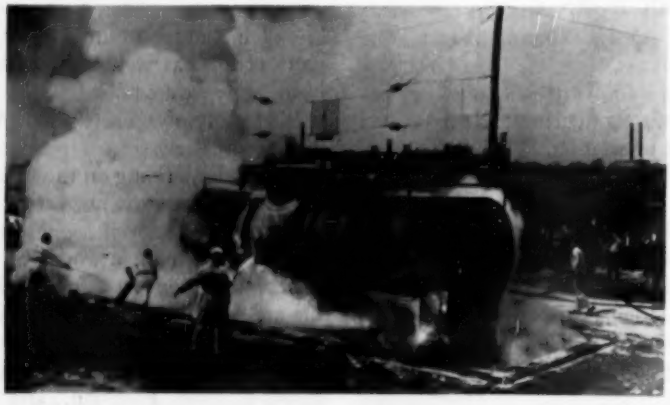
But there is one thing that we do know. We are in accident prevention work. We know that seldom do men die in accidents quite as bravely as did Richard Dale Foreman. We know, too, that such deaths are needless, especially when they occur because someone just didn't know the problems with which he is confronted in performing a particular job.

We know that proper training can prevent these tragedies, and we know that it is our job to see that our fellow employees are properly trained, in the face of whatever obstacles may be encountered in our efforts.

Let's dedicate ourselves to Richard Dale Foreman and his courage—to all of the Richard Dale Foremans who have been and who will be—and in his name make a solemn promise that we shall do all that is

Fire Fighters Field Day

This 10,000 gallon oil tank fire was the target for five dry chemical hand portable fire extinguishers at Fire Fighters Field Day in New Haven, Conn., recently. Here, the five men, most of them inexperienced in fire fighting and equipped only with 25 and 30 lb. extinguishers, approach the raging oil tank. The men were invited to take part in the demonstrations by Safety First Products Corp. to prove that anyone inexperienced in the use of fire extinguishers can operate the dry chemical units effectively.



EIGHT SECONDS LATER . . . the fire completely out . . . not a man singed . . . and only half of the dry chemical expelled to do the job! Previously, this same fire had been extinguished in 35 seconds by the high pressure fog control method used by many fire departments. In two other demonstrations, these same men and extinguishers completely put out gasoline primed oil fires in water filled sumps in less than five seconds.

Pictures by courtesy of Safety First Products Corp.

in our power to do, to see that these things never happen in our plant.

For if we make that promise, we shall never be called on to find out if some particular friend of ours has the courage to die as bravely as Richard did, without a whimper, and with no more than the comfort of a goodbye kiss from his brother.

God grant us the will to do this.

Air Control Vital

(From page 28)

ramp to allow fork trucks to drive into the Research Building and its freight elevator.

Because the driveway leading to the loading platform is depressed to provide a truck-height platform, a snow melting system is installed in the concrete drive. This makes for prompt removal of snow and ice and prevents a tieup of shipping facilities in bad weather.

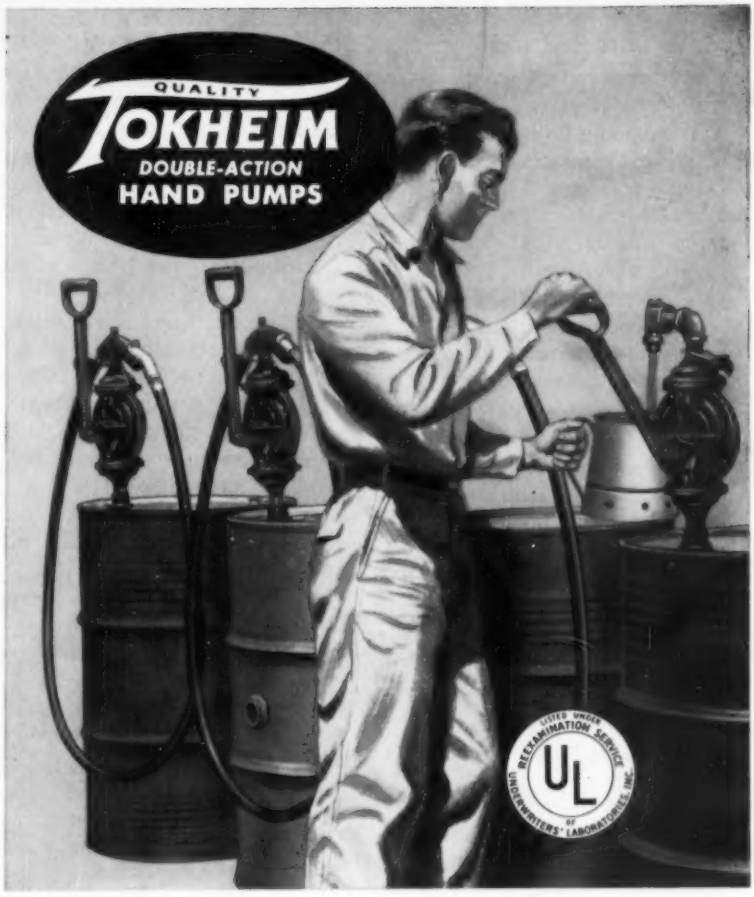
The Research Building contains administration offices of the Research, Medical, and Patent Divisions; a large conference room that will accommodate up to 200 persons; a research library; and the scientific laboratories of most of the departments of the Research Division.

For better coordination and operating efficiency, several members of the Medical Division have offices in the Advertising Section, located in the Warehouse Building, West Point, and three research departments, whose activities are more directly connected with production, are located within the corresponding production areas: Biological Development, at Glenolden; Pharmaceutical Development, at Philadelphia; Chemical Development, in the Synthetics Building, West Point.

Laboratory Design

Laboratory design in the new Medical Research Laboratories involves the most modern concepts of construction, to meet the demands of medical research for simplicity of building, versatility in use of space and ease of further expansion.

The building is based on the concept of modular design in which



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(For further details, use the Reader's Inquiry Card on page 75)

a laboratory becomes simply an assembly of standard work space units.

A laboratory unit size of 10 feet wide by 24 feet long was adopted as the module on which the entire design was planned. This unit is big enough to accommodate a row of laboratory tables, 30 inches wide, down each side with a five foot aisle between—working space for one or two research scientists. These units are arranged on both sides of the six foot wide center corridors throughout the four-story building.

Vertical service shafts three feet wide by five feet long carrying air, gas, vacuum, hot and cold water, deionized water, steam, electricity, drains, and fume hood exhausts, are placed every 10 feet along both sides of the corridors to serve the laboratory benches of the module units. Having all services readily available to each module provides flexibility for equipment installation.

Fume Control

The corridors are provided with false ceilings at a height of eight feet, four inches. The space above the corridor ceiling carries air-conditioning, heating, exhaust and ventilating ducts.

Fume hood exhaust blowers, water stills for distilled water, deionizers for deionized water, air conditioning and mechanical equipment are located in special rooms on the first floor and in the pent house, so that they can be maintained without interfering with laboratory operations.

Double-faced, glazed tile, nonbearing walls are used between laboratory module units and in most areas of the corridors.

Several modules within the building have been left unfinished and are available for future expansion.

Deionized water, used extensively in the laboratories, is carried through aluminum pipe into any laboratory that requires it. Distilled water is made by distilling deionized water in two small stills, one in each wing in the pent house of the building. It is piped in stainless steel, and outlets are provided on each floor of each wing.

Electrical services are distributed through the service shafts. The system is extremely flexible. Each shaft has its own electrical feeder with a series of circuit breakers for each laboratory. The circuit breakers can be quickly replaced by breakers of larger or smaller size, as needed to connect new electrical equipment.

Drains from the laboratories are run in the vertical service shafts on each side of the corridor and feed into mains beneath the first floor. The mains in the first floor are made of Duriron to minimize corrosion and are large enough to provide for future expansion of the building. Sanitary and chemical wastes are taken out of the building in separate drain lines for ease of waste treatment.

Each fume hood in the laboratory units is provided with its own exhaust duct and its own two-speed exhaust blower.

In addition to a freight elevator, there are two completely automatic passenger elevators, one in each wing of the building.

Contamination Control

Certain laboratory units in the Departments of Virology and Bacteriology are designed to prevent the spread of virulent organisms to uncontaminated areas. All air exhausted from isolation rooms is sterilized by passage through ducts in which batteries of ultraviolet lamps are installed before it is discharged to the outer air.

Entrance to the Bacteriology isolation area is controlled by a series of electrically interlocked doors. Additional ultraviolet lights are provided in both areas to minimize possibility of contamination. Any contaminated materials removed from the isolation areas go out through large steam sterilizers. Special toilet facilities are provided in each isolated area, so that people once in may remain for longer periods.

The air conditioning system for sterile rooms supplies air which has been mechanically filtered, filtered by electrostatic precipitators, treated with ultraviolet light, and distributed into the rooms through a perforated-plate type of diffuser to eliminate drafts.

Built into the Pharmacology Section are several special rooms in which measurements of nerve impulses in animals can be carried out. These rooms are completely shielded electrically by surrounding the floor, walls and ceiling with copper sheathing. Even the lights and telephone outlets are behind copper wire mesh. The shielding is so complete that a portable radio carried into the room immediately stops playing.

In all instrument rooms, heavy masonry balance tables are isolated from building vibration by means of cork.

The Analytical Laboratory in the Organic Chemistry Section, is an interesting example of the application of air conditioning to laboratory use. Since the room is used for accurate measurements of microscopic quantities of material, it is necessary to maintain a constant year around temperature of 75° F. and a relative humidity of 50 per cent. To do this, it was necessary to install double windows, carefully seal all walls, and gasket all openings in the area.

There are eight incubator rooms located strategically throughout the building. These are carefully designed so that temperature and humidity can be controlled to provide the exact conditions required for each test operation. Some of the rooms are provided with cooling as well as heating.

Several large refrigerated rooms are installed in the building to provide for storage of materials both at freezing and subfreezing temperatures. Some of the rooms are completely equipped laboratories designed so that experiments can be carried out in an atmosphere close to freezing. A secondary refrigeration system operating with chilled alcohol provides special cooling for some instruments, such as high speed centrifuges and grinding equipment.

In his dedicatory address John S. Zinsser, Chairman of the Board, revealed that in 1930 Sharp & Dohme had only three full-time research

scientists. "Today we have a staff of over 200 men and women, more than 70 per cent of whom are scientific personnel actively engaged in the search for new and improved products for the nation's health."

Value of Research

He pointed out that in less than 10 years the company's first laboratories, built specifically for research at Glenolden, Pa., were outgrown and research operations were scattered among 11 different building at that plant. The Glenolden laboratories, no longer in use, were opened in 1942.

"This new, larger building once again integrates our research facilities and is symbolic of our conviction that research is the foundation upon which the health and growth of this company depends," he said. "In it we hope to continue an intensified research program which now covers virtually every field of medicine.

"The new laboratories contain the most modern apparatus, instruments and machines obtainable. But far more important, we believe we have an outstanding team of men and women scientists, and we are confident that they will continue the progress they have made in the past," Mr. Zinsser continued. "Two of their significant accomplishments are the development of a large number of sulfa drugs in common use today, and the development of the lyophilization technique for the processing of dried human blood plasma, which saved countless thousands of lives of wounded soldiers in World War II and is doing the same work in Korea."

He pointed out that Sharp & Dohme scientists have many other less dramatic achievements to their credit. "The fact that considerably more than half of our current sales are in new or improved products introduced in the last 10 years—and our sales have tripled—is sufficient testimony to the kind of work they are doing."

"This growth through progress in research has also (To page 56)

Type B—illustrated above, with carrying case.

Type A—for fixed installation.

★ When SCOTT Demand Oxygen Inhalators are standard emergency equipment, you can be positive that your personnel and your safety record are more fully protected. Employees requiring oxygen for shock, fume inhalation, heart attacks and other respiratory difficulties can be treated quickly and easily with SCOTT units.

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(For further details, use the Reader's Inquiry Card on page 75)

TRANSPORTATION

Highway Safety Is Good Public Relations

A RECORD of driving more than 610,000 miles without a "chargeable" accident during the past five years won awards for seven drivers and other members of the Transportation Department of Raytheon Manufacturing Company, Waltham, Mass. C. F. Adams, Jr., president of the company, presented the group with initialed cigarette lighters as tokens of appreciation for the unblemished record of the organization, which operates a fleet of 32 trucks, covering more than 2200 miles each day, to move over 200 tons of freight. (Accidents are "chargeable" to a driver when he is at fault, it was explained.)

Recipients of the awards were Drivers James Besso, of West Newton; Charles DeLorie, of Newton Upper Falls; James Lenihan, of Watertown; Henry Veno, of Waltham; Andrew McIntyre, of Watertown; James Cavanaugh, of Lexington; and Thomas Duffy, of Revere. The department mechanic, Herbert Mann, of Randolph, and Walter E. McNamara, supervisor, of Waltham, also received awards for their contributions to the record.

Raytheon drivers have a long and consistent safety record. In the fall of 1949, seven drivers were given similar awards for their five-year records.

In paying tribute to the drivers' safety record, Mr. Adams said, "The Transportation Department is a vital link in the chain of Raytheon's widespread operations. The most important element in the entire setup of the department is the human factor—'the men behind the wheel.' Raytheon is proud of its driving record and of the men who have made it possible. These drivers, real experts in their line, have fought the battle of the highways for thousands of man-hours and hundreds of thousands of miles with safety and courtesy as their first considerations. In addition to performing an important service, they're doing a topnotch public relations job for the company."

Proper Care Prolongs Life & Safety of Tires

NOW is the time for all good auto drivers to keep this fact in mind:

"Heat is the greatest single enemy of rubber."

Tire engineers of the B. F. Goodrich Company point out that the terrific heat generated within the tire during high speed summer driving on hot highways causes many failures and results in increased tire wear.

Proper inflation can do much to prolong the life and safety of the tire, the engineers point out. Underinflation, for example, causes abnormal flexing of the tire with the result that there is a considerable buildup of heat which ultimately may result in serious tire failure.

BFG engineers recommend that vacationing motorists check the air pressure in their tires in the morning while they are cool. And be sure valve caps are on—finger-tight. Never let out air if the pressure rises during a trip.

The most economical speed at which to drive a car—both for gas economy and tire life—is between 35 and 45 miles an hour, they point out.

1 Out of 3 Vehicles Unsafe

PRELIMINARY reports of a nationwide "Safety-Check" covering more than one-half million cars and trucks reveal 32.6%, or nearly *1* out of every 3, are unsafe due to needed service attention to one or more parts affecting safe operation.

In announcing results of the "Safety-Check," W. F. Hufstader, Chairman of the Inter-Industry Highway Safety Committee, and Vice President of General Motors, said, "Vehicles today apparently are not as safe as a year ago when a similar sample check showed that 30.2% were in need of maintenance attention. The results of this check indicate the need for all owners to have their cars "Safety-Checked" periodically."

The "Safety-Check" program was conducted during the month of May by the Inter-Industry Highway Safety Committee in cooperation with the National Safety Council. Results were obtained on the basis of "Safety-Checks" made by the nation's automobile, truck and tire dealers of 551,296 vehicles in all states and the District of Columbia. Ten items affecting safe vehicle operation were included in the voluntary check.

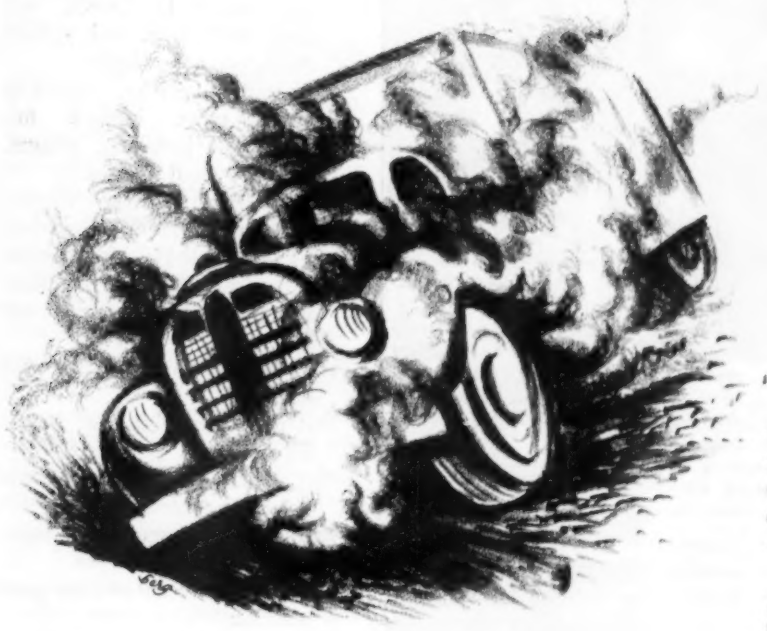
Brakes & Lights Head List

Heading the list of ten items checked were one out of seven brakes; one out of twelve front lights; one out of fourteen rear lights, and one out of fifteen steering and exhaust systems in need of maintenance attention for safe vehicle operation.

Of 335,016 passenger cars checked, 31.4% were in need of service attention compared to 30.6% in 1951. Of 46,704 trucks checked, 39.7% were unsafe compared to 27.2% in 1951.

What's New?
See pages 72–74

Build Fire Protection in the Trucking Industry



If the trucking industry is to cut its fire losses, it must honestly evaluate its hazards and use the best methods of control.

By R. C. COLEMAN, Vice Chairman
Trucking Industry Insurance Advisory Committee
American Trucking Associations, Inc.

TO BUILD" is a powerful phrase. It pictures desire, need, —and action!

A builder accomplishes things! He is qualified to plan for recognized needs. He produces results that not only meet the need but can be efficiently maintained and will continue to be profitable for many years.

To plan and build properly requires knowledge, vision, and utilization of established sources of information, material, and skill.

To improve its fire loss record, the trucking industry must first desire improvement; then plan intelligently and build with qualified help; and continue to use what it builds.

Experience has proved that return on investment will follow. The building of fire protection in the trucking industry involves three basic subjects:

First: FIRE PREVENTION —STOP FIRES BEFORE THEY START! Recognize each potential fire hazard of your operations at each location, and eliminate or minimize such hazards as far as possible.

Second: FIRE CONTROL—IF FIRE STARTS, BE PREPARED TO SNUFF IT OUT—AT ONCE! Provide adequate fire fighting means and persons trained to act in emergency.

Third: FOLLOW THROUGH —KEEP PLUGGING. Eternal vigilance is a bargain price, for FIRE-FREE operations in the trucking industry.

These principles apply to motor vehicle fires. They assume greater significance in terminal, garage, and other fixed locations where a fire loss can cost far more than the loss of a single motor vehicle.

The trucking industry pays a stiff price for preventable fires when injuries are suffered, property is damaged, cargoes are destroyed, motor vehicles burned, and terminals, garages and other fixed locations wrecked.

Actually, fire can involve as many as nine different forms of insurance coverage. Loss of use and other hidden costs add to the waste.

How Wise Are We?

Fire-wise, the trucking industry is not wise; accident-wise, it has accomplished much. Fire-wise, operating techniques have not kept pace. Dollar-wise, fire losses are staggering with life and limb also at stake!

Bluntly, haven't we side-stepped fire protection programs because fires are not every-day occurrences, and might not happen to us? When fire occurs, its severity is usually far greater than an ordinary accident.

Properly trained employees do

Ansul Dry Chemical Fire Extinguishers are safe to use. Ansul Dry Chemical is non-toxic and it produces no toxic fumes when in contact with the fire. Safety for the operator is a prime consideration in the design of all Ansul Extinguishers. Every part which will be subjected to pressure can withstand many times the actual operating pressure of the extinguisher.

Because dry chemical is a non-conductor, Ansul Extinguishers can be safely used on fires involving high voltage electrical equipment. The long range stream also allows fire-fighting of any type of fire at a safe distance.

(Advertisement)

SEE PAGE 17

not: thaw gasoline lines with a blow torch; clean parts with flammable material; cause welding fires; spill gasoline when fueling; fail to turn in fire alarms; or commit other careless acts that cause fire loss. Careless practices indicate lack of adequate training and proper supervision.

It is the responsibility of advisers on loss prevention to keep management "fire conscious," to stay on top of fire prevention and fire control practices, and minimize the fire hazards of operations.

Danger Points

To properly plan and build fire protection one must, with available technical advice, be able to evaluate, minimize, and control the fire hazards: of your vehicles; various terminal locations; merchandise in transit; refueling operations; loading and unloading operations where liquid fuel or other extra hazardous commodities are involved; exposure hazards from others; general "housekeeping practices"; and maintain a qualified fire fighting team at each location to meet an emergency should it occur.

It seems like a large order from a simple formula—but the need is urgent. Use the technical knowledge and mechanical means available, and follow through with the same drive put behind your programs of employee selection and training, and preventive maintenance practices for your motor vehicle operations. Your operating ratio will improve in proportion.

To start your plan, seek qualified help. Use the fire prevention engineer of your insurance company as you would your doctor. Insist on his services through your broker or agent. Don't rely on "home treatment." Technical "know how" is vastly more effective.

Fire Health Chart

Set up a "fire health chart" of your present motor vehicle, terminal, garage and other locations and operations. Most fixed location fires start from causes, accidents—so-called—that proper foresight would have prevented.

Let's consider some general factors for your "fire health chart."

DO YOU KNOW:

- that terminal employees must understand fire potentials of merchandise in transit, and must load, store, and protect shipments accordingly;
- that motor vehicles, especially power units, increase fire hazards at terminals, garages, or other fixed locations;
- that heating, lighting, electric power units and other machines are all potential ignition sources;
- that careless repair and maintenance practices cause many large fires;
- that paint shops increase fire hazards;
- that poor "housekeeping" breeds fires;
- that carelessly piled freight can block fire control;
- that large open areas hinder segregation of fires;
- that proper fire cut-offs are good practice;
- that your neighbor may put you out of business if he burns up;
- that a building located outside of city fire protection for economic or other reasons, requires extra fire control equipment.

These are but a few examples. Only technical analysis can develop a complete pattern for your health chart.

Building types range from the so-called "fire proof" to frame construction, and fire potentials vary greatly accordingly. When new construction is contemplated, seek advice from a fire prevention engineer as well as an architect in deciding on the type of construction and design. Construction costs, potential fire hazards; maintenance; and insurance costs should receive careful consideration. Proper planning before building or remodeling may save expensive renovation costs later.

Fire Control

Mechanical fire control involves several kinds of equipment. Fire extinguishers of proper type and number are a "must." Maintain them properly; indicate their location clearly; don't fence them in with carelessly piled freight or equipment.

Sprinkler systems, wet or dry; carbon dioxide fog systems; fire hose; and automatic watchman service all minimize fire loss potentials. They pay off in emergencies. Their cost can often be amortized over a reasonable period of time through lower insurance costs.

Good "housekeeping" pays. Eliminate "trash piles"—keep your premises clean and orderly. Provide proper receptacles for greasy rags and litter; require non-flammable cleaning agents. Inspect and repair electrical equipment frequently. Keep premises in good repair. Provide a continuous inspection and maintenance system of premises and vehicles, fire-wise, and require its regular use.

BE REALISTIC—BE AFRAID OF FIRE! Teach your employees to respect its destructive power; to protect your business—and their job! Against fire—your best defense is a strong offense.

Fire conscious employees reduce fire losses when properly trained and equipped with adequate fire control means. They can mean the difference between "small damage" and "total loss" since trained men take emergencies in stride. The first few minutes count heaviest in fire control.

Men who sell fire extinguishers and other fire control means are usually glad to help train your fire team in their use and maintenance and furnish educational booklets for your men.

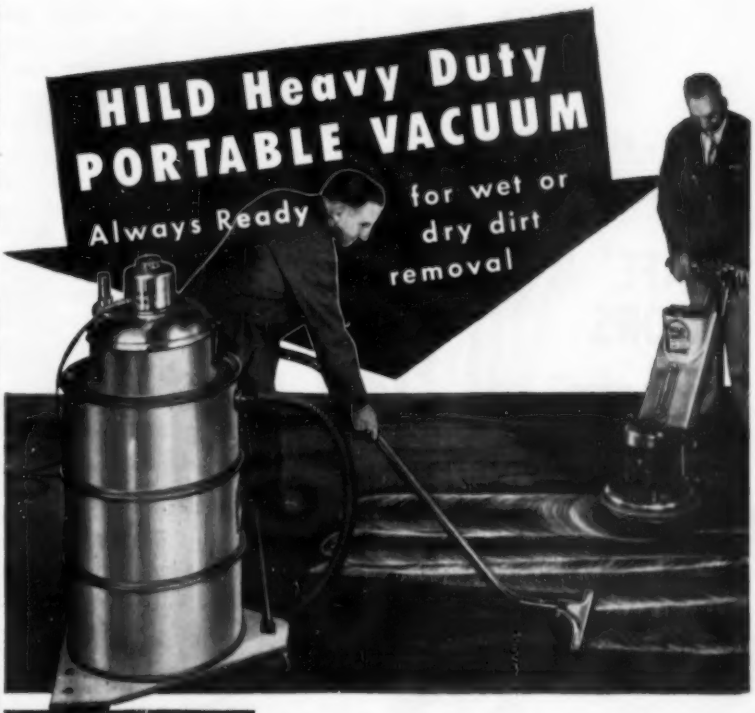
Motor Vehicle Fires

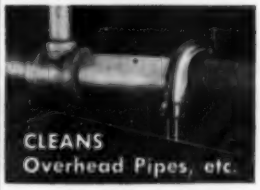
Fire potentials of motor trucks are inherently great. To operate they require a flammable fuel. When motor trucks are concentrated at one location the conflagration hazard is increased.

The fuel supply of a motor truck is truly its "vulnerable spot," since few motor truck fires become total losses unless the fuel supply is involved.

Accident prevention is vital to motor truck fire prevention. Fire losses that follow accidents will not occur if the accident does not happen! Liquified petroleum gas as a motor fuel has greater fire potentials than gasoline; and gasoline has greater fire potentials than diesel fuel. Proper fire prevention requires that protection of the fuel supply on the vehicle, its storage and handling in fueling operations, and fire control means be evaluated, planned and utilized accordingly.

The Bureau of Motor Carriers in reporting fire accidents of motor vehicles for 1950, states—"Fuel spillage is involved in the majority of fire accidents . . . and those acci-





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There are no adjustments to make...no filter to change when switching to wet pick-up work. Moisture in the vacuum air-stream cannot damage the special HILD Bi-Pass motor. Synthetic rubber vacuum hose and caster tires resist oil and grease. For easy portability the unit is mounted on a sturdy steel dolly with ball-bearing casters. The tank holds 40 gallons of recovered liquid. A 2-inch gate valve permits easy emptying into a drain or gutter.

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Hydraoxated Carnauba Dressing
for all floor surfaces

CETOX contains chemically hydraoxated Carnauba. No abrasives or silicas added. The slip is out. Its dazzling self-lustre, tough to mar qualities, and safety under foot are amazing . . . even under tracked in or spilled water.

Make the all-weather CETOX test. Put CETOX on *your* floor. See how it withstands heavy, abrasive foot traffic—throughout rain and shine. Get Super Safe CETOX for your floors.

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those accidents not involving spillage. Thus the severity of a fire accident, particularly collision or upset, can be reduced by preventing fuel spillage. Attainment of this goal can be obtained in the following ways:

(1) By locating the fuel supply in such a place as to reduce the likelihood of rupture,
(2) By designing the fuel tank to withstand better any impact,
(3) By carefully locating and adequately protecting other parts of the fuel system . . ."

This report also stresses the need for proper fire extinguishing equipment on the vehicle. It emphasizes proper loading of flammable cargo and fire prevention by dock men and others; the need for proper vehicle maintenance; and the need for training of drivers in accident and fire prevention.

Actually, there is no mystery to building an effective fire prevention and fire control program for the trucking industry. Established standards and analyses of fire prevention and control and recognized mechanical means have long been available.

However, the trucking industry must, first, want to do something about their fire losses; second, seek qualified help that is available; and third, keep actively on top of the program once it is established.

From an address presented at Council of Safety Supervisors of the American Trucking Associations, Inc.

Night-Drivers Warned Against Colored Glasses

NIGHT-DRIVING motorists are being warned against using any type of colored glasses as a supposed "cure" for the glare of on-coming auto headlights.

Six vision and highway safety experts condemned the use of colored glasses for night driving, pointing out that by reducing the motorists' over-all visual performance, such glasses would tend to increase rather than reduce highway accidents.

An interesting finding cited by one vision expert was that the usual type of colored glasses suggested for night driving tended to make the driver think he was seeing better, though actually causing him to see less, thereby introducing an added danger factor.

"People who think they see more clearly and with less glare while using yellow glasses at night are victims of an optical illusion," said Dr. Hedwig S. Kuhn, secretary of the Joint Committee on Industrial Ophthalmology of the American Medical association and the American Academy of Ophthalmology and Otolaryngology. "They have stated that they see better, but when their visual acuity is actually measured while wearing yellow glasses, it has been found that they don't see as well."

Pointing out that "the public has been bombarded with propaganda urging the use of colored lenses to combat headlight glare," Dr. Kuhn added:

"A sub-committee of our organization, composed of world-famous scientific authorities on tinted optical media, has just completed a study which condemns the use of any type of 'night-driving lens.' Any such lens, whether colored, reflected, or polarizing, reduces the total light transmitted to the eye and renders the task of seeing at night more difficult."

Dr. Deane B. Judd of the National Bureau of Standards, Washington, D. C., said:

"Unfortunately, actual measurements under night driving conditions indicate that the *impression* of seeing better with yellow goggles is illusory. Studies show that many people are favorably impressed with yellow goggles for night driving, but show without exception that the actual visual performance with the yellow goggles is less than that without. It would seem that the presence

What's New?
See pages 72–74

(For further details on advertised products, use the Readers Inquiry Card on page 75)

on the road of a large number of drivers who think they can see better than they really can is a potential danger. We especially regard the indiscriminate sale of yellow goggles for night driving to the general public to be dangerous because they may render the red and green traffic lights indistinguishable to about two per cent of the male population who are partially color-blind in the red-green sense."

Col. Victor A. Byrnes, of Randolph field, Tex., member of the Joint Committee on Industrial Ophthalmology, said:

"The use of yellow lenses for night driving jeopardizes public safety. Any reduction in brightness of the road as seen by the driver effectively decreases the distance he can see ahead of his car. Yellow lenses do not decrease glare because the brightness ratio between one's own headlights and oncoming headlights is not changed."

Lt. Cdr. Dean Farnsworth, of New London, Conn., member of the sub-committee of the JCIO, said:

"The problem in night driving is not simply to reduce the brightness of the oncoming headlights but to maintain the highest possible visibility of other objects on the road, and the visual cues which define the roadway itself.

"Unfortunately, any goggle which filters out visible light reduces the roadside cues disproportionately to the reduction in oncoming headlight brightness. Certainly the driver feels more comfortable and certainly he has reduced visual discrimination; he is a more comfortable driver and a more dangerous one. Any glass which reduces the brightness of oncoming headlights will blot out the fainter roadside cues upon which you depend for holding to the road —upon which you depend for safety and life."

Dr. H. Richard Blackwell, director of the Vision Research Laboratory of the University of Michigan, Ann Arbor, Mich., said:

"I cannot see any conceivable basis for prescribing the use of tinted lenses in order to reduce headlight glare in night driving. It is common knowledge among vision specialists that any reduction in glare effected by filters used in night driving will produce unacceptable loss in visual detection. The suggestion that they be used is not only scientifically unreasonable but also potentially dangerous to the highest degree. Any loss of visual detection capacity in night driving will result in appreciable increase in pedestrian or obstacle accidents."

David M. Baldwin, director, traffic and transportation division, National Safety Council, Chicago, said:

"The difficulty appears to be that while the introduction of tinted lenses may reduce the amount of glare reaching a driver's eyes, his vision is reduced at the same time. The loss of vision is continuous, for it is not logical to expect that a driver will put on his tinted glasses only when a vehicle is approaching and take them off as soon as the road is clear."

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Yes, this popular wide vision, one piece, clear Lucite plastic, No. 39 Eye Shield, 92½% optical clarity by laboratory test, is now available in four sizes: 39-A, 4¼" lens. 39-B, 5" lens. 39-C, 5½" lens. 39-D, 6" lens. The 5½" lens should accommodate even the large shell rim prescription glasses but the six-inch lens is offered because of its extra roominess. We suggest ordering in standard dozen lots 2A, 4B, 4C and 2D.

This is an extremely comfortable eye shield which achieved instant popularity when first offered in the smaller sizes.

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Shop owners and safety engineers from the Atlantic to the Pacific, from Canada to the Gulf, have urged us to furnish this eye shield in the larger sizes for use with prescription glasses.

If you are a shop owner or safety engineer and if you are not already furnishing this eye shield to your workers, we urge you to order a few pair from your dealer for test purposes.

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ACROSS MANAGEMENT'S DESK

Accident Rate in Small Plants Drains Manpower

"SMALL business" looms mighty big in America's $2,600,000,000 annual tab for industrial accidents.

Industrial enterprises employing less than 100 workers accounted for at least two-thirds of last year's industrial accidents, which cost 16,000 lives and caused two million injuiries, 1600 of which inflicted permanent total disabilities.

"The accident rate among our so-called small industries inflicts a tremendous drain on our national manpower resources at a time when the Department of Labor is predicting we're close to the bottom of the barrel," says Floyd E. Frazier, safety engineer for an insurance company association.

"Some statisticians," says Frazier, "estimate the 280,000,000 man-days lost to industry last year through occupational accidents exceeds the total annual man-days expended last year in a city the size of Pittsburgh."

Frazier points a warning finger at our relatively smaller companies.

"No employer can sub-contract safety," he insists. "But this seems to be the custom in our lesser business enterprises."

Steel and the other industrial titans annually produce the best safety reports, the present Safety Council statistics reveal. The smaller the business, the higher the accident frequency rate.

It's Frazier's theory that the average small concern thinks they'll have less accidents simply because they have relatively few employees. "They mistakenly take refuge in a distorted acceptance of the law of averages," says Frazier.

But, he explains, enterprises with 100 or less employees account for a minimum of 50 per cent of all gainfully employed Americans.

"Large companies have, as a rule, excellent safety programs, he continues. Machines are guarded, employees are repetitiously exposed to safety procedures through lectures, demonstrations and posters. The employer—often with the objective guidance of the insurance safety engineer—spends considerable money to eliminate potential or present hazards."

Safety Is Profitable

Frazier relies on the latest Safety Council and Department of Labor Statistics to prove this attitude is paying off. For the past ten years, and accounting for the large and often inexperienced labor force recruited during the war years and current defense production period, the accident frequency rate among large industries is annually being engineered downward.

But the trend is opposite in the smaller businesses.

"Every state has compensation laws today," continues Frazier, "and the employer, no matter how small, is legally obligated to protect his workers. He also has a moral, humanitarian obligation. But, aside from these two compelling forces, the proprietor of a small business can quickly see a distinct profit motive soon after making his plant or business more safety conscious."

Frazier cites the recent experience of a small beverage concern. They annually reported numerous employee injuries from broken bottles. The cuts were seldom serious and the firm regarded the compensation costs and medical care insignificant.

Enter the insurance safety engineer. His investigation soon convinced the employer that the total loss from bottle breakage was more than thirty times the injury costs.

The cause of the breakage was immediately eliminated. Both proprietor and employee gained.

Safety Through Associations

Expert safety advice and procedures can be obtained from state labor departments, insurance engineers and trade associations. Experience of big business in licking the same problem on a larger scale can be profitably copied by small enterprises in the same lines.

Frazier thinks the most expeditious solution of the small business adverse safety record is tackling the problem through the various trade associations. "While the small business-man may, with some justification, complain he can't afford the time for detailed safety studies, his trade association can."

To prove his point, Frazier outlined the ten-year program of the Ohio Association of Ice Industries. Through the association-sponsored safety program, accidents among member companies have been so curtailed that compensation rates have been reduced to one-fourth their former level. Group savings in compensation alone are estimated at $200,000.

The many small companies joined at the Portland Cement Association were, not long ago, high accident producers. By cooperating in an association-sponsored program, these plants have now reduced their accident frequency by 83 per cent!

Frazier says studies prove that better safety procedures in small plants result in three less obvious gains for the employer:

Morale is improved, resulting in efficiency; turnover is reduced as the plant gets a reputation as a safe place to work; public and community relations improve, as the employer eventually assumes leadership in promoting community safety and health activities.

Frazier is optimistic about an improvement in this situation. "Small business will respond," he says, "as soon as they are made to understand that, as a group of our national economy, they pay most of this $2,600,000,000 annual occupational accident cost, and their workers and their families suffer most of the consequences of the 16,000 deaths and two million injuries each year in industry."

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WHY? Because *the* quality product does the job *with less labor*. It has been proved time and time again that inferior materials are really most expensive because they require *extra time* and *added supervision* for correct use. Reduce labor costs, save the cost of "re-doing" a faulty job . . . by using only high quality maintenance products like Seal-O-San Wood Finishes, Korex Germicidal Cleaner, and Anti-Slip Cosmolite Wax, made by Huntington Laboratories. Ask us for the 1952 Sanitation Handbook. *Let us show you how much you can save this year on maintenance.*

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(For further details, use the Reader's Inquiry Card on page 75)

Civil Defense Stockpiles

CITIES and towns should build a stockpile of all emergency supplies necessary for at least the first four hours following enemy attack, the Federal Civil Defense Administration warned recently.

The Administration said it would take that long for State and Federal supply services to come to the aid of a stricken community with the additional food, medical supplies, clothing, fuel and other materials necessary to relieve suffering and make emergency repairs to property.

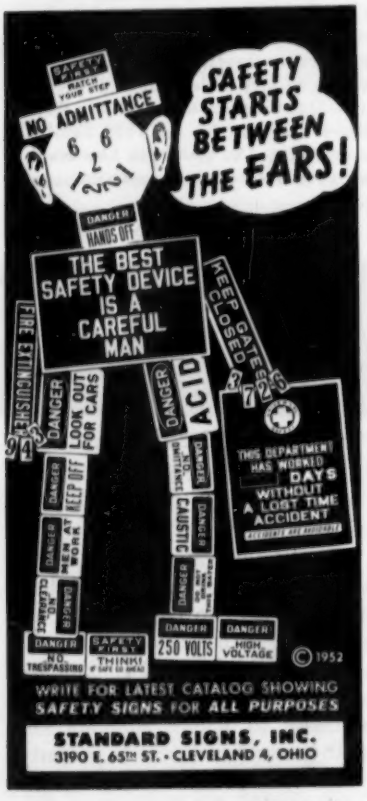
"Every city must be prepared to survive and to help others that may

be stricken," continued the FCDA in its new booklet "The Supply Service," now being distributed to State and local civil defense directors and supply officials.

The booklet points out that if one of our cities is attacked, "the degree of survival will depend to a great extent on the amount of equipment and supplies available to civil defense forces to minimize the effects of attack and to restore the population's productive effort."

Under the Federal Civil Defense Act of 1950, the States and communities have the primary responsibility for civil defense supply. The FCDA provides necessary coordination and guidance, and some financial and material help.

Prior to an emergency, civil defense chiefs and supply officials are urged to work with local experts in industry and commerce to set up a well-developed supply plan incorporating normal channels of distribution as much as possible. Householders are urged to maintain a normal three-day food supply.


SAFETY STARTS BETWEEN THE EARS!
NO ADMITTANCE
THE BEST SAFETY DEVICE IS A CAREFUL MAN
DANGER HANDS OFF
KEEP CLOSED
DANGER ACID
DANGER LOOK OUT FOR CARS
DANGER KEEP OFF
DANGER KEEP AWAY
DANGER CAUSTIC
DANGER
DANGER NO TRESPASSING
SAFETY FIRST THINK!
DANGER 250 VOLTS
DANGER HIGH VOLTAGE
© 1952
THIS DEPARTMENT HAS WORKED DAYS WITHOUT A LOST TIME ACCIDENT
WRITE FOR LATEST CATALOG SHOWING SAFETY SIGNS FOR ALL PURPOSES
STANDARD SIGNS, INC.
3190 E. 65TH ST. · CLEVELAND 4, OHIO

The booklet recommends first priority on available supplies be assigned to casualty relief activities such as hospitals, first-aid stations and mass care centers.

It also outlines an emergency plan for local use to be placed in operation immediately after an attack to equalize food distribution and prevent "panic buyers" from hoarding food.

Thereafter, food would be supplied to regular eating establishments, factories, schools and retail food outlets. In some areas "emergency grocery stations" would be set up to meet the needs of surviving households.

The booklet divides civil defense supply activities into four periods:

1) Preattack—organizing, staffing, planning, procuring, warehousing and training;
2) Alert and Attack—preparing to go into action as soon as the attack is over;
3) Postattack—providing the materials necessary to continue emergency operations;
4) Restoration—salvage, replenishment, payment and preparation for another attack.

In most States, existing legislation permits the governor or director of civil defense to supplement existing civil defense supplies during emergency by seizing or expropriating materials from manufacturers and suppliers.

Copies of the publication may be obtained for 20 cents from the Government Printing Office, Washington 25, D. C.

College-Industry Committee on Material Handling Education

IN ORDER to make it possible for engineering students better to equip themselves for fruitful industrial service in the fast-growing technology of material handling, the 78 major manufacturers of material handling equipment (acting through their trade association, The Material Handling Institute) and the nation's 3,000 professional material handling engineers who are members of the American Material Handling Society have joined hands with leaders in the field of engineering education to form an autonomous College-Industry Committee on Material Handling Education. The committee's work will be dedicated to five clear cut objectives:

1. To make available to colleges and other study groups material of recognized quality for use in courses on material handling.
2. To initiate development of new material, not presently available, for use in such courses.
3. To become known as a source and authority on sound good-quality information for material handling courses.
4. To stimulate more teaching of material handling (and the importance of material handling) in the nation's colleges and universities.
5. To determine from industry what skills and understanding it requires in the material handling engineers the colleges turn out.

At its organization in New York City a group of eleven educational and industrial leaders was constituted as the basic work force and four more leaders in engineering education will be added as the programs get under way:

Task subcommittees will assess costs, plan financing, select a permanent chairman from the engineering college field, and outline first steps. Institutions, business groups, professionals, industrial firms and individuals interested in the committee's work are encouraged to correspond and cooperate.

Although conceived jointly by the AMHS and the MHI, the new body will be free-standing and take its cues directly from the engineering colleges in answer to whose perennial requests for better educational material the activity was organized.

(For further details on advertised products, use the Readers Inquiry Card on page 75)

SKIDPROOF
SAFETY FLOOR FINISH

Keeps Floors Safe And New-Looking

EVERYTHING FOR INDUSTRIAL HEALTH AND SAFETY

You can depend upon Con-Sol Products for every maintenance problem — cleaning, insect or bacteria control, floor upkeep, health and safety.

Write Con-Sol technicians without obligation, about any specific health hazard or unusual condition in your plant. Many years of experience and over a hundred industrial housekeeping products are available to solve your every maintenance need.

Helpful Maintenance Chart On Request

Skidproof gives any type of floor — wood, linoleum, rubber, asphalt, tile or terrazzo — a hard, durable slip-proof surface that protects against the toughest kind of wear. It's easy to apply, easy to clean. It's quick-drying, odorless, economical — one gallon covers 2000 square feet!

Skidproof overcomes the slipping hazards of ordinary wax — makes rubber burns, stains and surface damage easy to get off — won't crack or check — won't discolor any floor surface. It's the finest surface finish available to keep floors shining, beautiful and safe!

Tested and approved by Underwriters Laboratories

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(For further details, use the Reader's Inquiry Card on page 75)

The Injury Picture

(From page 32) injury rates during the latter part of 1951 in contrast with the upward trend observed during 1950 and the first part of 1951.

Of the 126 individual industries for which quarterly data were available, 83 showed significant decreases between the third and fourth quarters of 1951; 13 showed increases; and 30 recorded changes of less than 1 frequency-rate point. Decreases of more than 5 frequency-rate points between the third and fourth quarters were recorded by 17 of these industries. The more important decreases were noted in logging, bottled soft drinks, miscellaneous wood products, sheet-metal work, canning and preserving. Three furniture industries—both metal and nonmetal household and public building and professional furniture—reported substantial decreases. Sawmills, both with and without planing mills showed decreases.

Comparisons of the 12-months cumulative rates for 1950 and 1951, however, indicate significant increases for 68—or almost half—of the 138 industries for which such data are available; 49 recorded little change; and only 21 reported decreases of 1 frequency-rate point or more. These comparisons indicate that high rates prevailing during the first 3 quarters were not entirely off-set by the lower rates in the fourth quarter. As a result the annual averages for many industries were higher in 1951 than 1950. In 16 industries the 1951 annual averages were more than 5 frequency-rate points higher than 1950. Seven of these industries, however, showed substantial improvement in the fourth quarter of 1951.

Industries reporting the highest injury-frequency rates for the 12 months of 1951 were logging—102.6, boat building and repairing—57.0, sawmills—54.6, planing mills—53.3, saw and planing mills, integrated—51.0, veneer mills—45.9, structural clay products—40.3, and beet sugar—40.2.

Outstandingly low rates for the 12 months of 1951 were reported by synthetic rubber—1.7, synthetic fibers—1.8, explosives—4.0, aircraft—4.4, miscellaneous communication equipment—4.5, electric lamps (bulbs)—4.8, radio tubes—4.8.

FREE POSTAGE

Readers Inquiry Card Will Bring You Further Information on Advertised Products New Products Bulletins & Catalogs

See page 75

SAFETY MAINTENANCE & PRODUCTION Salutes a Safety Idea for AUGUST

Vote for a Man with Vision

BASIC to any successful safety program is the finding of new ways to remind personnel that safety is a part of their jobs. It is not always easy to work out a novel approach to safety-awareness, one that will immediately catch the employee's interest and hold his attention. There is also the additional difficulty that in striving for novelty one may lose sight of the safety-educational goal that is the real purpose of the program. To be fully effective, safety materials must strike a delicate balance between what is appealing and what is strictly informative.

One company that has found a way to present a safety message in an unusual manner is the John A. Roebling's Sons Company. Taking advantage of the lively interest in the political scene, so evident in this national-election year, they used an election ballot type of presentation for an eye protection message in an issue of "On Guard," the accident prevention section of the company newspaper, "The Roebling Record."

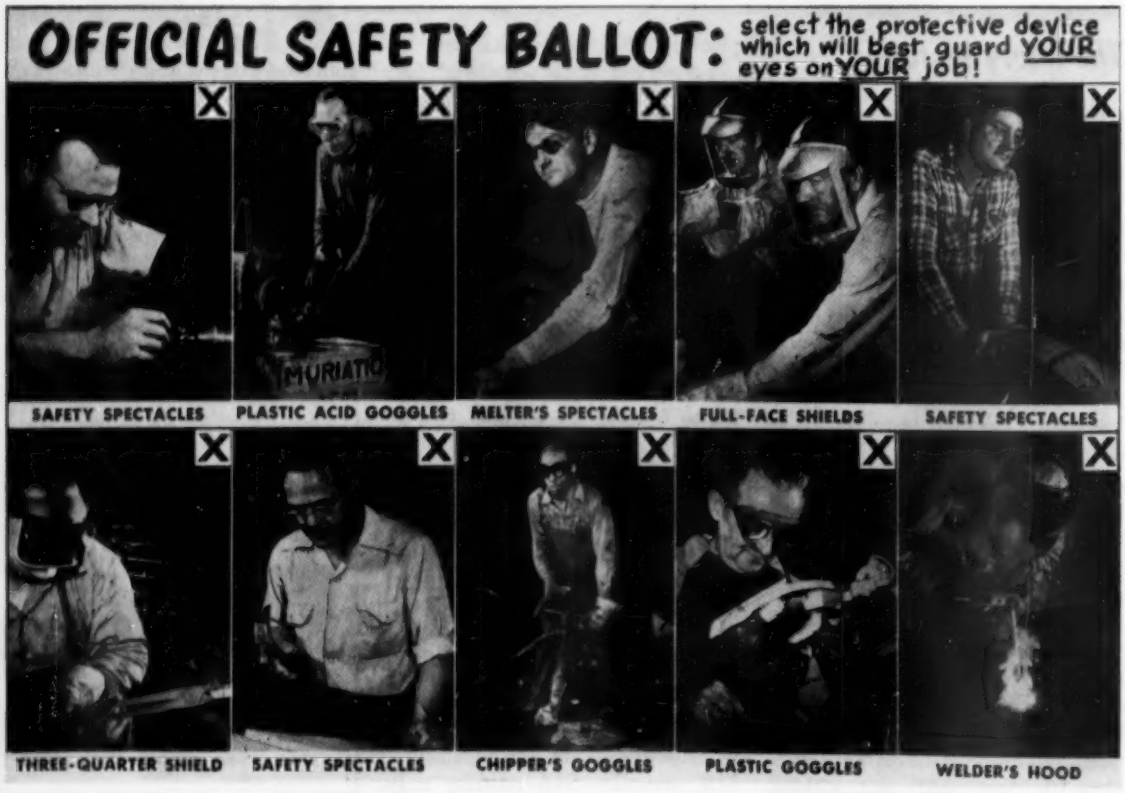
The ballot display appeared in the June issue of their publication and the story gained much of its appeal by its reference to the then forthcoming national nominating conventions leading to Election Day.

The headine, in convention banner form, exhorted the reader to "VOTE FOR A MAN WITH VISION!" This was followed by a brief message: "At the National Conventions the AYES will have it. Be sure your EYES will have it . . . protection that is . . . all the time. Make eye protection the number one plank in your personal safety platform!"

The rest of the full-page display was taken up by the "Official Safety Ballot," which is reproduced here. The series of pictures show the various types of eye protection equipment that should be worn on different jobs in the Roebling plants.

The unusual feature of this eye protection presentation is that the ballot itself is the most interesting part of the display and there is, therefore, no let-down after one's attention has been caught by the stimulating headline. A salute, then, to a good idea and particularly for its effective execution.

Pictures reproduced by courtesy of "The Roebling Record."



Safety Courses at N. Y. U.

A WELL-ROUNDED program of courses in industrial and/or traffic accident prevention, leading to Certificates in Industrial and Traffic Safety is announced for the fall term beginning September 22nd, 1952, by the Center for Safety Education, New York University.

These courses, given only at the University, are designed for all those who desire a through grounding in industrial and traffic accident prevention. Full certificates, awarded on the completion of eleven courses (which may be taken in two consecutive terms), carry the advantages of substantial educational accomplishment.

Courses to be offered in the fall term are:

REQUIRED COURSES: Accident Prevention—Its Background, Objectives, and Relationships; The Philosophy and Basic Principles of Accident Prevention; Industrial Hazards—Mechanical and Personal. Control Methods; Fire Prevention and Protection Inspection; and Organization and Administration of Traffic Safety Programs—Industrial, Community, and Governmental.

ELECTIVE COURSES: Vision in Industrial Safety and Motor Vehicle Operation; Effective Speaking in Accident Prevention; Principles of Safety Inspection; and Marine Accident Prevention.

All courses are given in the evening. For registration information and full particulars concerning other activities of the Center, write to Dr. Walter A. Cutter, Center for Safety Education, New York University, Washington Square, New York 3, N. Y., or call SPring 7-2000, Ext. 632.

GRIP IT... Safely

USE A Safe-Hi CHISEL GRIP

Hand-held impact tools are frequent causes of accidents... lost time... medical expense. Safety and efficiency both skyrocket when workers use Safe-Hi Chisel Grips. No fear of hitting fingers; strike a full blow every time. Chisel won't creep in grip. Rubberized fibre band insulates hammer shock from handle, adjusts to chisel shape, instantly. Fast acting wing-nut release adjusts to chisel size up to 1". Larger size also available. Durable... light... inexpensive.

For holding Star drills, Marking Dies, Punches, Gouges, Test Tubes, Chisels, Etc.

See your safety dealer or write

SPECIFY Safe-Hi PRODUCTS for a greater safety factor

ROSE MFG. CO.
732 Club Bldg., Denver, Colo.
• SAFETY BELTS • LADDER SHOES
• POLE GRIPS • WALL GRIPS • CHISEL GRIPS
LIFELINES & LANYARDS

(For further details, use the Reader's Inquiry Card on page 75)

When Lightning Strikes

LIGHTNING is a deadly enemy of man riding the wings of every thunder cloud, ready to invade without warning and deal death and destruction.

According to Census Bureau reports, every year in the U. S. there are approximately 400 fatalities from lightning and the number of injured is estimated at 1500.

Accurate statistics on the amount of property damage caused by lightning on all types of structures are not available. Connecticut alone estimates its total annual loss from lightning at $4,000,000 to $6,000,000 not counting the damage that is unreported.

The Subcommittee on Fire Loss Statistics, Farm Fire Protection Com. of the National Fire Protection Association estimates that, on farms alone, fire annually destroys $90,000,000 worth of property. Of the principal causes of farm fires, lightning ranked first, having started 37% of the fires. That 37% of farm fires caused by lightning amounts to an impressive yearly loss of $33,300,000.

So when the direct and indirect losses from lightning are added, the

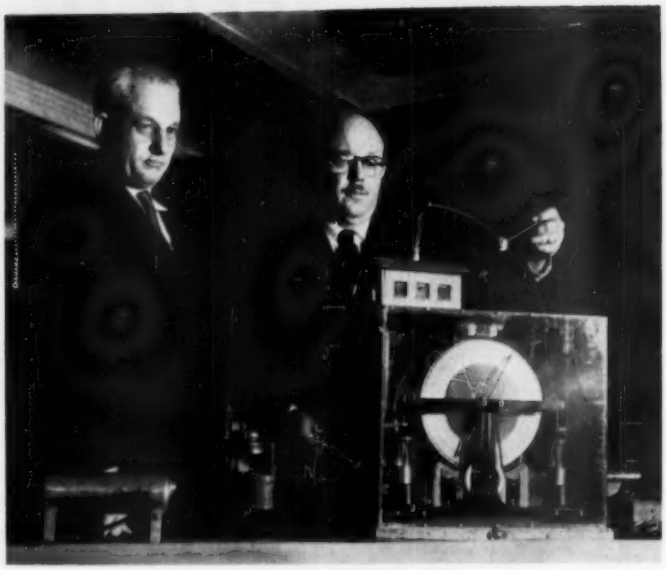
total is a staggering national annual loss. This is deplorable because much of it can be prevented by approved lightning protection which is recognized by all of the leading authorities. The National Fire Protection Association states that there are few fire causes against which so reliable a defense is available, when the equipment of an approved type is properly installed and maintained.

Approved Protection

A Master Label of approval of a system is the most satisfactory assurance which a property owner can obtain that the lightning rod installation he has provided will actually give him the safety from the lightning hazard that he has reason to expect. These labels are issued by the Underwriters' Laboratories, Inc. and can only be obtained for installations where all parts of the system are types which have their approval

(Continued at bottom of third column)

Safety Pageant at Eastman Kodak



MINIATURE LIGHTNING. G. M. Kintz, left, and H. F. Browne of the U. S. Bureau of Mines demonstrate on a small scale what happens when lightning strikes a home. The two safety engineers reported at the recent Kodak Park Safety Pageant in Rochester, N. Y., that lightning kills 400 persons annually in the U. S.

AN ESTIMATED 10,000 persons visited a four-day Safety Pageant at the Kodak Park plant of the Eastman Kodak Company, Rochester, N. Y.

Safety at home, at work, and on the highway formed a triple theme for the show designed especially for Kodak Park men and women and their families.

Featured in the pageant was a special demonstration of "The Magic of Fire," a nationally famous fire safety show presented by the U. S. Bureau of Mines. Visitors witnessed demonstrations of the causes of fires and explosions by G. M. Kintz and H. F. Browne, safety engineers of the Bureau's Dallas, Texas, office. With their equipment the engineers reproduced on a laboratory scale the conditions that often result in tragedy.

In explaining how fires start, the Bureau of Mines men demonstrated how simple precautions in the home can prevent disaster.

The roll of static electricity as a fire and explosion hazard was graphically shown. Fire fighting apparatus and safety devices were demonstrated.

The safety show is one of a series of traveling lecture-demonstrations developed by the Dallas office of the Bureau of Mines for accident prevention and health protection purposes.

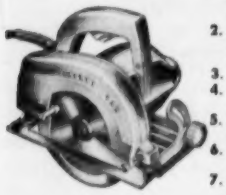
Several Rochester civic groups toured the Kodak Park Safety Pageant, according to Phillip C. Wolz, director of plant security and general chairman of the pageant. Besides a visit to an extensive display in the Kodak Park recreation building, they inspected the plant's new safety center where fire department and plant protection facilities are housed. A number of local and national organizations also had exhibits on display.

(Continued from first column)

and where the completed installation passes the inspection of their field workers.

This Master Label program was inaugurated by Underwriters' Laboratories, Inc. early in 1923 and since that time, over 150,000 Master

. . . Before you buy a saw, consider the maximum protection offered you in the Stanley W65 Safety Saw. It costs no more, yet you get quality ball bearing construction *plus* all these safety features:



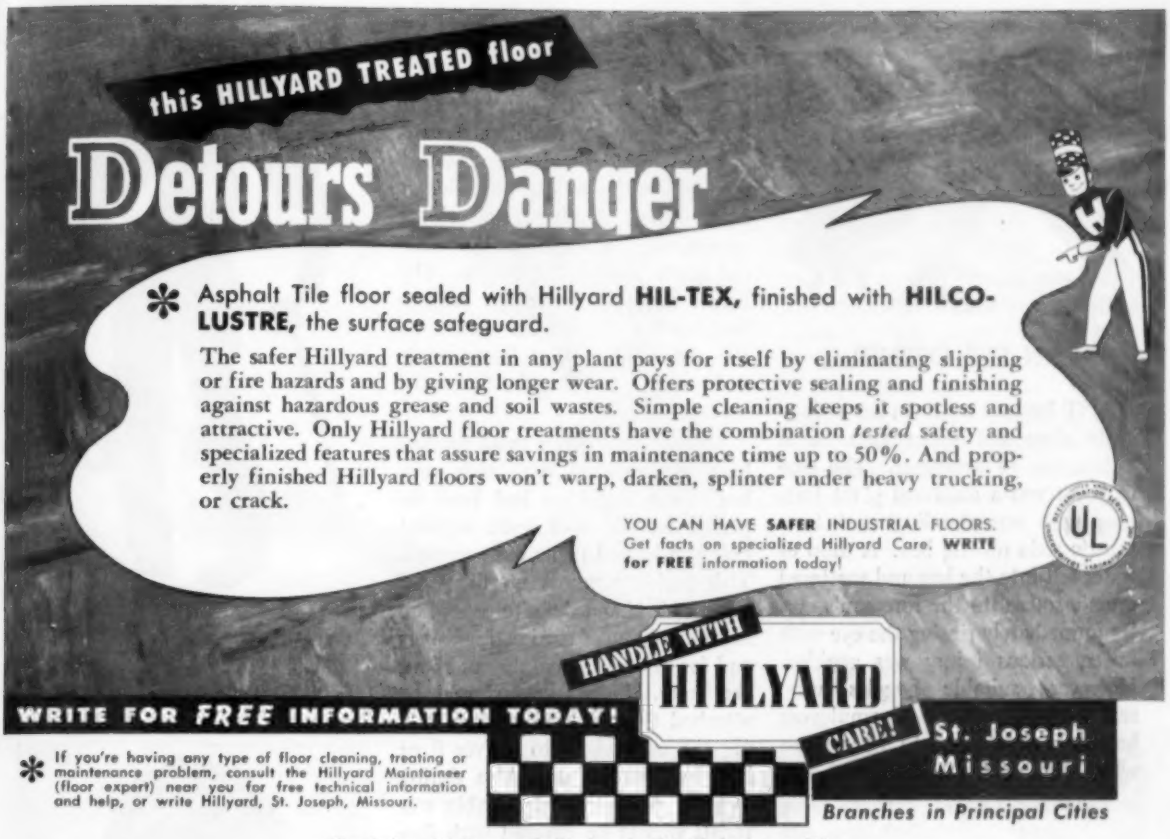
1. Has automatic telescoping safety guard.
2. Finger knob for manual guard control.
3. Non-slip handle.
4. Dust blower keeps work surface clear.
5. Three-wire cord, one for grounding.
6. Momentary contact switch.
7. Patented blade flanges to avoid kickback.

For Safety as well as service — specify Stanley in your plant. See your dealer or write Stanley Electric Tools, 427 Myrtle Street, New Britain, Connecticut.

STANLEY
Reg. U.S. Pat. Off.

HARDWARE • TOOLS • ELECTRIC TOOLS
STEEL STRAPPING • STEEL

(For further details, use the Reader's Inquiry Card on page 75)


this HILLYARD TREATED floor
Detours Danger
Asphalt Tile floor sealed with Hillyard HIL-TEX, finished with HILCO-LUSTRE, the surface safeguard.
The safer Hillyard treatment in any plant pays for itself by eliminating slipping or fire hazards and by giving longer wear. Offers protective sealing and finishing against hazardous grease and soil wastes. Simple cleaning keeps it spotless and attractive. Only Hillyard floor treatments have the combination tested safety and specialized features that assure savings in maintenance time up to 50%. And properly finished Hillyard floors won't warp, darken, splinter under heavy trucking, or crack.
YOU CAN HAVE SAFER INDUSTRIAL FLOORS. Get facts on specialized Hillyard Care. WRITE for FREE information today!
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HANDLE WITH
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CARE!
WRITE FOR FREE INFORMATION TODAY!
If you're having any type of floor cleaning, treating or maintenance problem, consult the Hillyard Maintaineer (floor expert) near you for free technical information and help, or write Hillyard, St. Joseph, Missouri.
St. Joseph
Missouri
Branches in Principal Cities
(For further details, use the Reader's Inquiry Card on page 75)

Labels have been issued. The reports of damage by lightning to these structures protected by a Master Label system are so few as to be practically negligible, showing an efficiency of more than 99.9%.

New Hazards

Insurance records reveal that human carelessness in not keeping a lightning protection system up-to-date and the use of inferior equipment account for almost 100% of reported loss from lightning on rodded buildings.

Many property owners do not realize that improvements or changes to a building may make their lightning protection system ineffective. A property owner should notify the installer when changes are made to a building already protected, such as, a new addition to the building, or the installation of new equipment such as a telephone, a radio or television antenna, a water system, an electrical system, a hay track, metal cattle stanchions, etc.

Today, there is a rapid increase in the use of television receivers. Since proper reception usually necessitates an exterior antenna of considerable height, there is a great possibility of damage by lightning and it is therefore important that the antenna is properly grounded to prevent this destruction.

If the building is equipped with a lightning protection system, the antenna should be properly interconnected to the system. If, however, there is no existing lightning protection system on the building, then the base of the antenna should be grounded with standard lightning protection cable and connections to a ten foot ground and to a main water pipe. This will protect the antenna but offers little protection to the rest of the building.

With the improvements in construction methods for buildings and work simplification in and around them, the simple lightning rod of grandfather's day has become an engineering problem—one that demands that each lightning protection system be designed and installed by a qualified technician. A faulty lightning protection system can prove more hazardous in a storm than no system at all.

Engineering Handbook

A NEW second edition of the famous "Handbook of Engineering Fundamentals," edited by Dean Ovid W. Eshbach of the Northwestern Technological Institute, has been published by John Wiley & Sons.

Thirty-nine distinguished scientists contributed to this completely revised reference book, known for its thorough coverage of all phases of engineering. Since the appearance of the first edition in 1936, many new developments and changes in emphasis in various branches of technology have (To page 63)

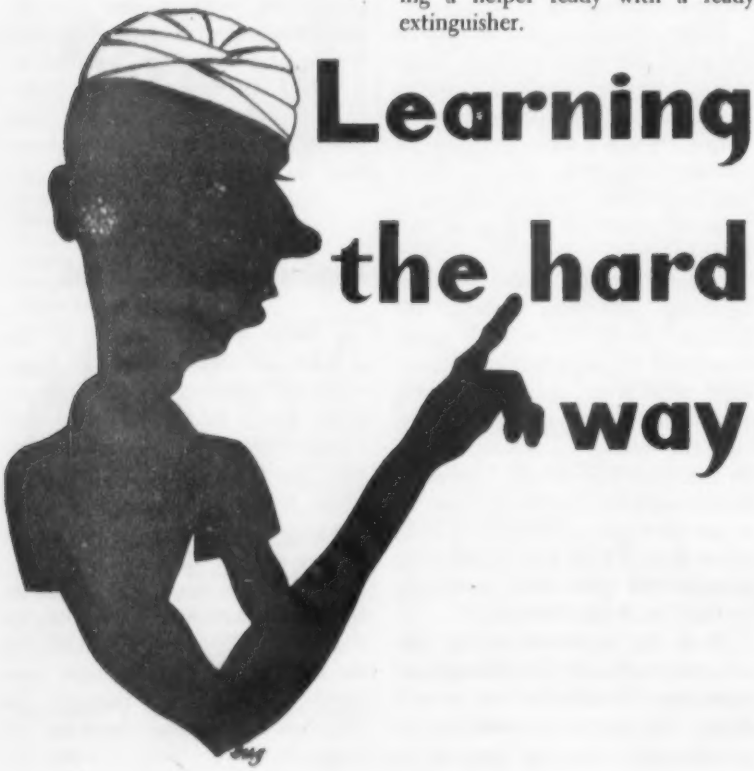
AN EYE OPENER

JUST because a person has authority does not mean that he is immune to accidents. The case in point was a chemical plant foreman who was standing next to a caustic soda mixing box. A drop of water fell into the box and spattered caustic soda into the foreman's eye. By immediately rinsing the eye with water, serious injury was avoided. However, suitable goggles were readily available and all employees had been instructed to wear them when near the caustic.

THE HELP THAT WASN'T THERE

QUITE correctly, because of the proximity of flammable material a welder had a helper standing by with a carbon dioxide extinguisher. During the welding operations, a spark from the torch did ignite some baled cotton. The helper came to the rescue only to find that the extinguisher was empty. He obtained another immediately and was able to bring the fire under control.

Two weeks earlier a small fire had been extinguished with this unit; but the extinguisher had been replaced on the wall hook without being recharged or its use reported. This incident points up the need for establishing a definite procedure for the refilling of used extinguishers and for instructing employees about the rules. Instructions should be attached to each extinguisher, telling the user where to deliver it or how to report its use. Also, during welding operations, flammable materials should be covered with fire-resistant canvas, in addition to having a helper ready with a ready extinguisher.



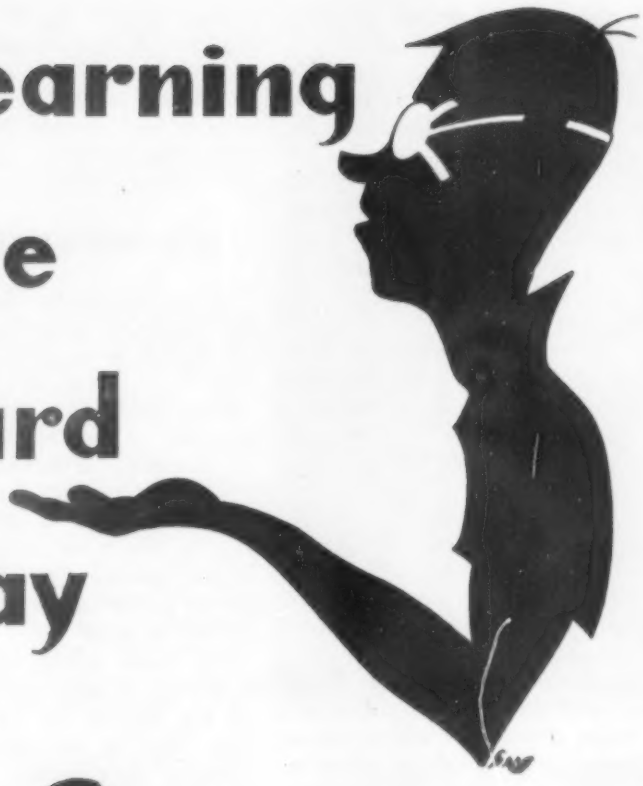
Learning the hard way

USED HEAD, WORE HAT

PROTECTIVE hats, if you ask Dave Quackenbush of Star Lake, N. Y., not only protect against falling objects, they also offer protection to the falling object itself. In this case, Quackenbush was the falling object. A jackhammer operator at the Jones & Laughlin Steel Corporation's Benson Mines, he fell while drilling a large rock. Although he landed on his head on a pile of rocks, his hard hat was held securely on his head by the chinstrap. The hat absorbed the impact, shattering so that the force of the fall was dissipated, and his head, neck and spine were saved from serious injury.

Picture by courtesy of Mine Safety Appliances Co.

Learning the hard way



TOO EASILY SHOCKED

TOO many people are too easily shocked, that is, they persist in not making certain that the power is off when electrical maintenance work is to be undertaken. While installing a new switch, pipe cutters were used to cut through a metal conduit. However, the cutter went through and struck the hot wires inside the conduit. The resulting electric shock killed the electrician.

THE ACID TEST

WHILE removing a blank from an acid line, an employee was sprayed slightly with acid. He was wearing goggles and continued working until the job was finished. When he removed his goggles, he wiped his hand across his face and in this manner introduced some of the acid into his eye. Although his eye felt irritated, he did not report the incident to his foreman until the following night. The next morning he was taken to a doctor who treated the injury for four days and then had to hospitalize the victim. The fact that the employee was an experienced maintenance man underscores several facts about accidents and injuries: 1. Even an old-timer can be careless, 2. Training in safety and correct procedures must be continuous, 3. Provide safety equipment, but see that employees know how to use it, 4. Acids and other irritant chemicals should be washed off at once, even though protective equipment is worn, 5. Report injuries immediately.

UNCHECKED MOMENTUM

DRIVERS of trucks may have full control of their vehicles and be able to bring them to a sudden stop. Often overlooked, however, is the manner in which a truck has been loaded. In other words, can the load itself survive a sudden stop without breaking loose? Several fatal accidents have occurred because rolling types of freight have not been lashed properly to the body of a truck or semi-trailer. In one accident, a truck was carrying large reels of cable, with chocks set only under the last reel. When the driver stopped short in traffic, the reels rolled forward crushing the driver in the cab.

Another accident involved a semi-trailer loaded with several long pipes. The unit was forced off the road by another driver, rolled several hundred feet in an upright position and then was stopped suddenly by collision with a tree. The unit remained upright, but some of the pipes crashed through the front of the semi-trailer and impaled the driver.

Easily moved materials should be securely lashed to the floor of trucks. In some cases a barrier should be fastened across the nose of the truck to prevent freight from crashing through into the cab.

Luxury Liner

(From page 26) detection and smothering of any possible blaze has no equal anywhere on the seven seas. The slightest wisp of smoke or undue rise in temperature is registered instantly in a manner to cope with possible fire long before passengers become aware of potential trouble. A specially designed automatic smoke and heat fire detecting system combined with a network of piping that can carry carbon dioxide gas to every vital area provides our Mistress of the Seas with the most modern fire protection system on any ship.

Fire protection engineers planned the piping network and the carbon dioxide discharge system so that the exact quantity of fire-smothering gas reaches the fire-source immediately after the alarm sounds. This eliminates guesswork and makes split-second fire control practical.

Fire warning is obtained with a robot warden: a detector that picks up, through the same piping network that carries the gas, any trace of smoke in various strategic parts of the ship. When the detector "smells" smoke, both audible and visual signals sound the alarm. A simple turn of a valve on the control panel will then discharge the right amount of the non-conducting, non-damaging carbon dioxide gas into the area afire. The robot smoke detector is located in the wheelhouse. It guards cargo holds, store rooms, repair shops, and other normally unattended locations where smoldering or flash fires might occur.

Heat detection equipment guards areas such as electrical equipment stations and galleys where excessive heat or combustion might cause flash fires.

Large banks of carbon dioxide cylinders are strategically located throughout the ship. These are opened through pressure-operated controls that permit simultaneous discharge of the predetermined number of cylinders needed to "flood" completely the threatened area with carbon dioxide. This development eliminates the individual manual release of all cylinders and provides a rapid, high concentration of the fire extinguishing carbon dioxide gas.

The new marine fender on the docking pier is built to withstand the impact of the vessel and prevent damage to the pier and to the ship itself. Photo shows inn arc of pilings, first vertical rubber cylinder, three horizontal rubber cylinders (fourth is permanently below water), wooden vertical sheeting, wales and outer arc of piles. The cylinders are anchored to the pier by wire rope in foreground.

Electric Eyes

The ship is equipped with the most modern version of every aid intended to facilitate the navigation and handling of the superliner and to promote the safety of the passengers, the crew and the vessel itself. As an additional safety measure, practically all the equipment necessary to navigate the ship and transmit orders dealing with its operation is installed in duplicate. Thus a rapid changeover can be made in the event of the failure of one system.

One of the most unusual installations is the sleek, glistening aluminum radar mast on which are located the antennae for the vessel's electric eyes. A fully enclosed, heated crow's nest replaces the old-type open platforms on which the lookout man of years ago was threatened with freezing during a winter storm on the turbulent Atlantic.

Radar units will enable the ship to proceed safely through the fog and darkness. By merely glancing at screens in the wheelhouse, the navigator knows at all times how close he is to land, another ship or any other object within range of the liner's powerful electric eyes.

Shock-Absorbing Pier Fender

To protect both the ship and the pier and to aid in docking the 53,000-ton high speed superliner, a new type marine fender has been constructed on Pier 86, North River, according to James N. Conway, terminals engineer of the United States Lines. It is expected that the new specially designed fender will be able to absorb the impact of the largest American merchant ship, thereby preventing damage to either her hull or to the pier.

The fender consists of two concentric arcs of piles, sunk deep into the river bottom with the space between taken up with special rubber cylindrical dock fenders. There are 22 piles in the outer ring and 21 in the inner ring attached to the pier. These piling arcs, together with the huge rubber tubes make up the entire fender which provides a high degree of resiliency and 27 inches of compression space to absorb the shock.

Normally it is extremely difficult to dock a ship in the North River when there is a strong ebbing tide and a northwest wind, and "It would be a shame to keep her anchored in the harbor after she comes in from a high speed run across the Atlantic," Conway said.

A tremendous glow of pride in the accomplishment of our nation's maritime, shipping, scientific and decorating authorities was born when the "United States" approached its newly renovated and enlarged pier. That glow burst into a rocket of excitement when the superliner broke all speed records on her maiden voyage and brought back to American shipping the blue ribbon trophy of the Atlantic for the first time in more than a century. The world of accident and fire protection can doff its hat in salute to

a Great Lady who, while dressed in luxury and wearing a crown of speed supremacy, can carry the banner of safety to the four corners of the world.

Picture credits: C-O-Two Fire Equipment Co.—pages 24 & 26; Goodyear Tire & Rubber Co.—page 54; United States Lines—page 25.

X-Ray Protection

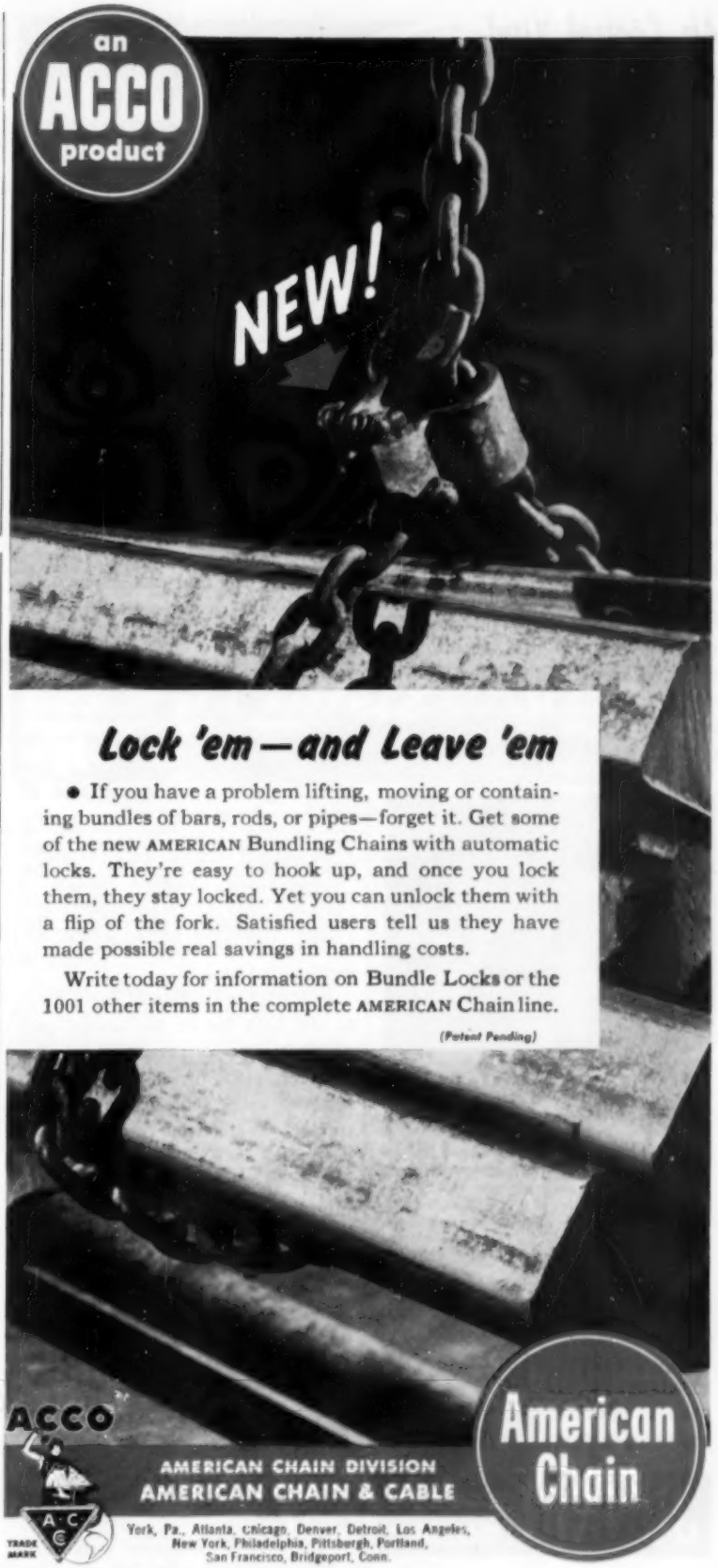
"X-RAY *Protection Design*," by Harold O. Wyckoff and Lauriston S. Taylor, is a National Bureau of Standards Handbook 50, available for 15 cents from Government Printing Office, Washington 25, D. C.

This handbook contains primary factual data and basic principles necessary for designing shielded X-ray installations. It is based on the recommendations of the National Committee on Radiation Protection. Architects and designers of buildings and rooms in which X-rays will be used for fluoroscopy, radiography, or therapy can derive much helpful information from the handbook's discussion of these recommendations and from its sample design problems and methods of computing barriers for real installations.

In discussing typical cases, the handbook gives a variety of examples to illustrate the application of the fundamental principles and recommendations. It carries out detailed calculations showing how to arrive at the optimum conditions providing sufficient protection for safe operation with the most economical form of radiation shielding. Protection requirements both for persons working with the equipment and for persons in adjoining areas are considered.

Although many publications dealing with X-ray protection have appeared, no previous handbook has undertaken the explanation of certain assumptions and recommendations or included detailed design specifications. These rules and recommendations are based on the best data available at this time but may require revision as knowledge of the field of X-ray protection increases.

(Note: Foreign remittances must be in U. S. exchange and should include an additional one-third the publication price to cover mailing costs.)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(For further details, use the Reader's Inquiry Card on page 75)

Air Control Vital

(From page 37) meant more jobs for more people. In 1942, Sharp & Dohme had 2500 people on its payrolls. Today the company employs approximately 3700 men and women, who serve the medical and allied professions in all parts of the world. So it is not difficult to demonstrate that research and industrial progress go hand in hand," Mr. Zinsser said.

"Research in the drug industry, as in most progressive industries in the United States today, is highly competitive, but it is the very nature of this competition that has made for such rapid strides in the development of new and better products for the treatment and prevention of disease. It has brought untold benefits to the sick and suffering the world over, and the accomplishments of our country's medical research scientists are a tribute to the system of free competitive enterprise under which they operate."

"Research on such a scale involves risk taking—projects on which large amounts of money are expended are not always successful. We believe this investment is an expression of our faith in the future. And the most important element in that future is the preservation of freedom that has given this country the highest standard of living the world has ever known."

Water Spray

(From page 20) for personnel while closing leaks within the sprayed area.

2. It produces turbulence in the air around the tank and thereby speeds the dilution of the gas with air and with water vapor, thereby helping to produce a safe mixture which is too lean to burn or explode.

3. In case ignition of the escaped gases should occur, from any source, the application of water spray to the entire surface of the tank at a rate of 0.25 gallons per square foot of surface per minute prevents any dangerous increase of temperature inside the tank, regardless of the intensity of the flames under or near it, thereby preventing the build-up of pressures sufficient to rupture the tank.

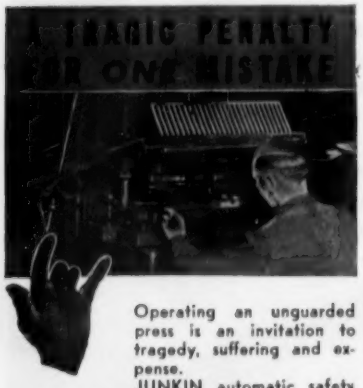
4. Early application of water spray to the tank before fire occurs produces a wetted condition of the surface thereby preventing fire from forming black sooted areas on the surface. Water runs off soot like it does off a duck's back. Sooted areas permit the leakage of heat to the interior of the tank. They also permit local overheating and weakening of the walls of the tank, increasing the danger of rupture and explosion. Properly engineered fixed water spray systems apply spray to every square inch of tank surface and effectively eliminate the soot-spot danger. The application of water spray to assure protection against soot-spot danger calls for experienced engineering and proper nozzle design.

5. With a properly engineered water spray system in operation LPG *can be permitted to burn itself up within the spray protected area,* thus rendering it harmless and eliminating all down-wind hazards. Heat from the flames accelerates the vaporization of the water spray. When converted into vapor, water spray supplies approximately 1700 times its volume as an inert vapor which joins with the nitrogen and other inert gases in air to dilute flammable gas-oxygen mixtures, rendering them too lean to burn or explode. This use of water spray is called "controlled burning." Each gallon of water spray vaporized absorbs at least 8080 B. T. U.'s of heat in addition to providing around 1700 gallons of inert vapor for dilution of the gas-oxygen flammable mixture.

Water spray protection is the only system which permits the safe burning of escaped LPG where it leaks out within the spray-protected area. For leakage which may occur in piping remote from the areas protected by a fixed water spray system, safe disposal of the escaped gas or liquid can be provided by hose lines equipped with low velocity spray extension applicators,—such as are provided by means of the three-way combination nozzles. In circumstances, where the leakage cannot be shut off, or during the period before it is shut off, the danger from escaping gas can be localized by intentional lighting, *providing no accumulation has occurred in low areas downwind.* The gas torch resulting can be prevented from injuring nearby properties and structures by keeping it covered with an evenly filled umbrella of spray. Turbulence induced by the spray and water vapor evaporated from the spray render any unburned portions of the escaping gas relatively harmless.

Explosive Power

Anyone who has seen pictures or read of the LPG fires and explosions at Newark, New Jersey can appreciate the importance of having ample



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water-spray applied to storage tanks to prevent rupture of the tanks and explosion of their contents in case of fire. Photographs of that disaster show erupting columns of gas rising to levels reported as high as three thousand feet before they mixed with enough oxygen from the air to create flaming torches in the upper air, raising smoke clouds to the eight thousand foot level. Heat from these towering flames was reported to be felt as much as two miles from the center of the blaze. When it is realized that both propane and butane flames create temperatures around 3,500°F the danger from such terrific heat is obvious. Water-spray applied to tanks, which may even be surrounded by fire, prevents uncontrolled release of such high-temperature flame gases.

Explosions, such as that at Newark, which hurled a sixty foot section of tank half a mile through the air to land on a gasoline filling station, setting fire to six automobiles, and threw other smaller sections of tanks three quarters of a mile from the blast, emphasize the extreme danger of permitting heat to build up pressure within LPG storage tanks. Water spray is the only practical means yet devised which can dissipate the heat from burning LPG as fast as it is released by the flames.

Preventing LPG Explosions

That rare good judgment known as "common sense" will tell anyone acquainted with the properties of liquefied petroleum gas that it is not safe to extinguish the flame of escaping LPG when there are any values of life or property down-wind or down-grade from the leak. It is always wisest to shut off the supply of gas feeding the leak before any extinguishing means is used to snuff out the flame. To extinguish the flame and let unburned LPG flow down-grade or with the wind is simply to spread an explosion hazard.

Fire and explosion hazards from LPG occur only when there is leakage and at such times several things become immediately necessary to avert disaster.

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First: the leak must be located and the leakage stopped. Fixed water-spray protection makes this possible with safety to the personnel doing the work.

Second: Heat transfer to the storage tanks must be prevented to avoid the build-up of rupturing pressure within the tanks. Properly engineered fixed water-spray protection does this, even when the entire tank is enclosed in flames. In the absence of flame, the water-spray reduces tank temperature, thereby reducing gas pressure and diminishing flow through any leak.

Third: Positive air turbulence should be provided to hasten the dilution of escaped gas by the nitrogen and inert gas content of the air to make the mixture too lean to ignite. Without dependence upon any wind to assist it, water spray provides a sustained air movement which hastens the dilution of escaped LPG.

Fourth: Additional inert vapor should be provided to speed the dilution of the escaped LPG. Water-spray is an abundant source of such inert vapor, the finer droplets in the spray vaporizing at ordinary temperatures to produce water-vapor and at the same time lowering the temperature. In the presence of the 3,500 degree flame of burning LPG, higher proportions of the water spray and larger droplets are vaporized, diluting flammable mixtures of gas-oxygen and reducing the temperature of fire gases so that they are less capable of raising nearby flammable materials to their vaporizing and ignition temperatures.

The relative importance of each of these several corrective actions on an LPG leakage situation can only be appraised when time has given us more examples. In the meantime any substitute method of protection should be seriously appraised to discover whether any of these protection values can be safely omitted from any specific LPG storage protection specification.

Pictures by courtesy of Grinnell Co.

THE FIRE FRONT

Bulb-Type Extinguishers Are Inadequate

BULB-TYPE carbon-tetrachloride fire extinguishers tested by the National Bureau of Standards have been shown to provide decidedly inadequate fire protection. As hand extinguishers, they proved much less effective than the one-quart carbon-tetrachloride pump-gun hand extinguisher; and their use for automatic protection of the enclosed space used in the tests was disclosed as almost completely ineffective even when they were installed in double the number recommended by the manufacturers. In response to numerous inquiries concerning bulb-type extinguishers, the NBS has published the results of extensive tests of these devices in *"Fire Tests of Bulb-Type Carbon-Tetrachloride Fire Extinguishers"* by O. J. Hodge, available for 10 cents from the Government Printing Office, Washington 25, D. C.

The NBS investigated seven different models of bulb-type extinguishers using carbon tetrachloride, of which six were designed both for hand and for automatic operation and the seventh for automatic operation only. Separate results from tests of the devices as hand extinguishers and as automatic extinguishers are presented in tabulated form. The report includes diagrams both of the general type of extinguishers tested and of the test set-ups used.

As hand extinguishers, the bulb-type devices were generally found to be impractical principally because of the manner in which the extinguishing liquid was applied. Tests demonstrated the inadequacy of the bulb-type devices for automatic extinguishment of fire in all trials except three in which the fire was in a pan favorably located directly beneath the extinguisher.

Fire Taxes Too High

IN OUR race to maintain Western supremacy we cannot afford the expensive luxury of the 'fire tax' which is levied against every man, woman and child on the North American continent," said retiring President A. H. S. Stead in his address which opened the five-day Annual Meeting of the National Fire Protection Association in New York City. "Some pay the tax in death, others in dollars," continued Stead, "but none of us, regardless of age or innocence, can escape his share. There is represented here an aggregate waste of lives, wealth, time and energy which becomes more disgraceful each year that it is permitted to continue. Other countries, behind us in most material progress, learned the sad lesson fire teaches generations ago and have outstripped us in many aspects of conservation. Their way of life is careful and saving—not careless and profligate."

President Stead, rallying the members of the NFPA to meet the challenge of fire's constant threat to this continent's security and economic well-being, stressed that with the backing of the technical know-how developed by its technical committees, the NFPA must now take the leadership in educating all people with a basic understanding of fire prevention.

Charles F. DeMey, Vice-Pres. of the Columbia Gas System Service Corp., New York City, told a meeting of the NFPA Fire Marshals' Section that more than fifteen hundred key personnel of his company have been trained in special fire fighting schools. He said that fire fighting drills are conducted periodically to acquaint employees with procedures to follow and location of equipment.

Charging that the most serious traffic problem confronting the nation today in the transportation of explosives is the inadequate width of main highways, R. Granville Curry, American Automobile Assn., Washington, D. C., reported that seventy-one per cent of primary rural state highways are less than twenty-two feet in width. Curry said: "The width of the ordinary truck-trailer combination is substantially 8 feet. Thus when two trucks each 8 feet wide are passing on an 18 foot highway, each truck has only one foot of clearance in each lane. If a truck carrying explosives should collide with an oncoming truck, or perhaps a school bus, particularly under adverse weather conditions or faulty lights, the disastrous results are not difficult to imagine."

General Manager Percy Bugbee reported that NFPA membership stood at an all-time high of 14,000 members. He said that 1,854 new members were added in the past 12 months and that these new mem-

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bers came from every state, every Canadian province and from 30 other countries.

Norman Key, Secretary of the National Commission on Safety Education, a division of the National Education Association, Washington, D. C., received a citation from the NFPA for the work the Commission has done to integrate fire safety education in the nation's public schools. The American Hospital Association is the only other national group to have been so honored.

Labelling some fire marshals, fire chiefs, and building officials as "too timid in connection with their operations," Horatio Bond, Boston, Chief Engineer of the National Fire Protection Association said that courts are not likely to question the rights of such individuals to frame "suitable requirements to carry out the obvious purposes of their office."

Bond also said, "Many cities have had the experience of adopting a building code with high hopes that they have solved the problem of public regulation of building safety. Then along comes a proposal to erect a building which appears to be entirely suitable but which conflicts with some requirement of the building code. In some cities, the building official does not quite know how to deal with this type of situation and he therefore may shut his eyes to a good many troublesome details. In other cities it has been customary for the particular property to be authorized by a special ordinance. This practice has been frowned on by conscientious building officials and to avoid it area limits of the codes have been made so large that the code does not function as a means of providing the safety which is intended."

Fireman Shortage

Twenty years of war, depression and inflation have weakened the nation's fire defenses, according to Herbert M. Bogardus, Chief Engineer, New Jersey Rating Association. One of the most serious situations confronting the fire service today is the fundamental problem of manpower which becomes more serious each year by reason of reduced working hours and the urgency of paying salaries and providing benefits commensurate with competing forms of employment.

Said Bogardus, "Our observations made during the routine municipal surveys and in conjunction with the promotion of improvements reveal a serious deficiency in company strength in the paid fire departments. During vacation periods it is common for engine and truck companies to operate with a platoon strength of three to five men, which is 30 per cent to 60 per cent below the generally accepted standards requiring seven men on high value companies. This situation is a direct result of the reduced working hours and higher salaries which now require a minimum expense of $10,000 per year per man on duty as compared with $4,000 to $5,000 per year

per man on duty in the days of eighty-four hour work weeks and firemen's salaries below $2,000 per year. This shortage in manpower necessitates multiple alarm response to fires which would normally have been limited to first alarm response. In many cities it is necessary to roll two pumping engines to provide a crew of sufficient size to man one. The extra movement of fire apparatus exerts a toll in wear and tear and increases the accident probability. The resulting cost offsets to some extent the savings in salaries effected by the small platoon strength. Furthermore, this policy leaves portions of our cities without adequate coverage for simultaneous alarms of fires in other areas, and frequently delays fire fighting operations where rescue work is of primary importance and requires engine company manpower to offset the deficiency."

Bogardus added that the potential threat of falling aircraft emphasizes the need of strengthening our fire forces as to equipment and manpower, and recommended that firemen's training be expanded to provide knowledge of aircraft rescue and aircraft firefighting techniques. Bogardus offered as a possible solution extensive permanent fire department mutual aid programs which would not only form the bulwark of our Civil Defense activities but could be put into immediate operation for all peacetime disasters.

Harry P. Cooper, Jr., Secretary of an insurance company association, told the delegates that during the past ten years the national property fire loss has risen from $325,000,000 in 1941 to an estimated $823,000,000 in 1951. "During the same period," Cooper declared, "the farm fire loss had risen from $95,000,000 to $100,000,000. Percentagewise, while the national fire loss was increasing 153.8% the farm fire loss only increased 5.26%."

Charles W. Carmody, Chief, Operations Branch, Department of Commerce, Civil Aeronautics Administration, Washington, D. C., in discussing communication with and direction of emergency and fire equipment at airports said that lack of adequate communications facilities necessarily limits the utility of emergency equipment and the speed with which equipment can reach the desired spot. He said, "Once the initial alarm has been given, and the equipment leaves its station, two-way radio communicaton is essential. It cannot be stressed too highly that without two-way radio at least half the potential value of the investment in manpower, training and equipment is completely wasted." Two-way radio permits equipment to start moving toward a crash or fire with a minimum of basic information, to be directed through heavy airport traffic with greatest expediency, and often permits equipment to be actually "on the scene" when the accident occurs.

Around the clock preventive and protective programs must be provided for our growing reserves of raw materials and finished products, and for our critical industrial facilities upon which rests the success of our peace and war program, declared L. A. Vincent, General Manager of the National Board of Fire Underwriters. Vincent forecast great changes in building construction. He foresaw the disappearance of the chimney when heating by electricity eliminates the need for furnaces and chimneys. He predicted that buildings of the future will be larger with more light weight metals and said that plastic sheeting will probably replace glass windows and have wide spread use as awnings. In fire protection he forecast more efficient use of water in fire extinguishment and improvements in optical automatic detection of fire.

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Device for Testing Emergency Showers

HOW to check a shower without taking one is accomplished by a special shower tester used in the General Electric Company's Research Laboratory.

Showers are installed at strategic points in workrooms of the laboratory to douse a scientist in case his clothes catch fire or in the event of acid burn.

Although they rarely are used, showers have to be in working order and are checked periodically. Devised by Howard H. Fawcett, labo-

(For further details, use the Reader's Inquiry Card on page 75)

ratory safety engineer, the special tester permits water from the shower to be squirted into a large funnel, from which it is carried into a can. A hose conducts the water to a nearby sink.

Maintaining Interest

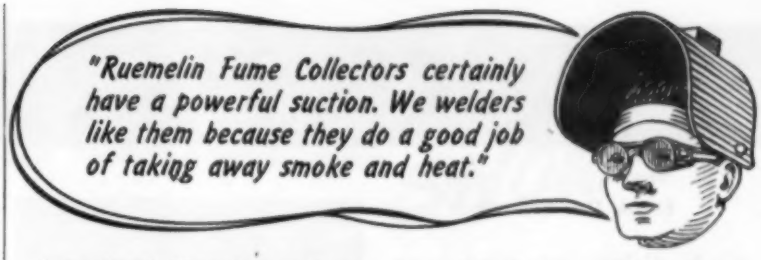
(From page 12) in this category. The annual meeting of Industrial Hygiene Foundation last fall was devoted to a number of excellent papers on the subject of executive health. The preceding year a panel on "Maintenance of Worker Health," was presented.

Medical Records

Another value of the medical records is in the analysis and statistical study of accidents and their causes. From these analyses comes the information which first of all aids the safety department in the proper direction of its energies—the frequency with which a certain operation results in injury, for instance, is a very helpful bit of information to the safety director. When a reduction in frequency or severity of certain injuries is achieved, representatives of both the union and management will be extremely interested and should be advised. Those cases in which a personal problem or a physical abnormality is picked up by the medical department can frequently be handled in cooperation with the personnel department, and its interest and support can be most helpful in rearranging job requirements or work schedules. Frequently the personnel department can resolve a family problem to the benefit of both the company and the worker even though this problem may have been brought to light during a medical consultation.

In conclusion, the point should be stressed that any program of health and safety, no matter how well conceived or thorough-going in its application, cannot succeed to the fullest extent without the continued interest of all those concerned in its direction—that is, the safety department, the medical and personnel departments, and all those for whom it is devised, namely, the workmen. It is also necessary that interest in such a program be maintained by top management and by the unions. Furthermore, it is my conviction that the medical department should play a very important role in the matter of maintaining this interest among all the parties concerned.

From an address presented at the 13th Annual Southern Safety Conference.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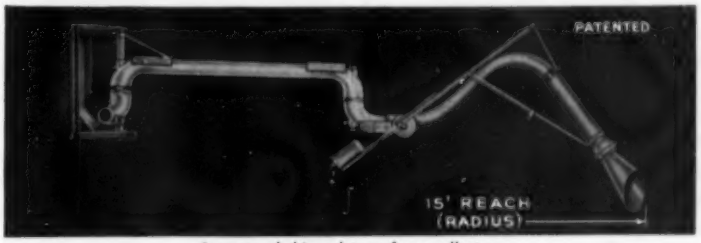
Welding shops equipped with Ruemelin Fume Collectors enjoy a clean working atmosphere. Smoke, heat and gas are removed quickly and efficiently. Working conditions greatly improved . . . production increased. For the large welding booth, a long reach model (shown below) makes it easy to reach any welding job. 15 ft. and 18 ft. sizes. Available in wall type or underslung ceiling type brackets.

Portable models also available. Write for Fume Collector Bulletin 37-D.



Long reach hinged type fume collector

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(For further details, use the Reader's Inquiry Card on page 75)

Plant Maintenance Show

THE Plant Maintenance Show, attended each year by top executives of virtually every industry, has been scheduled for the Public Auditorium in Cleveland in 1953, it was announced by Clapp & Poliak, Inc., New York, which conducts the exposition. The dates are Jan. 19 to 22, inclusive.

The show, which developed from new management techniques in preventive maintenance, has risen in three years to one of the nation's foremost industrial expositions. Experts from all parts of the world attend.

The 1953 show will be almost 75 per cent larger than its 1952 counterpart. Exhibits will cover a gross area of 110,000 square feet. Compared to the first show in 1950, it will have almost four times as many exhibiting companies and cover about six times as much area. At least three companies, General Electric Co., Westinghouse Electric Corp. and Clark Equipment Co., each will have displays covering three thousand square feet. Three hundred and fifty other companies are expected to conduct exhibits.

The Plant Maintenance Conference, conducted by Clapp & Poliak during the first three days of the show, also will be held. The conference broke all attendance records for this type of gathering in Philadelphia earlier this year.

Advance registration cards may be obtained from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

INSIDE THE TRADE

Breck Co. Expands

ON JUNE 1st, warehousing, shipping and part of the manufacturing operations of John H. Breck Inc. were transferred to the new Breck plant on Lowell Avenue, West Springfield, Mass. Upon completion of extensive remodeling and installation of new production equipment, all manufacturing will be carried on in this new location.

This move was made to consolidate operations formerly conducted on the second floor of the Breck building and in a leased warehouse, both located in Springfield. All other executive and administrative functions will be carried on in Springfield as in the past.

The new Breck property in West

Springfield, purchased from Container Associates last December, includes, on eight acres of land, a one-story brick building containing 50,000 square feet of floor space, a railroad siding, outdoor storage areas and extensive parking areas. When in complete operation, the new plant will employ approximately 200 men and women.

The Breck Company was founded in 1901 by John H. Breck, Sr. When his son, Edward J. Breck, joined the firm in 1929, the present corporation was formed. At the present time, there are, in addition to the Springfield and West Springfield locations, branch offices or warehouses in New York City, Chicago, San Francisco and Ottawa, Canada, with Breck Preparations being sold throughout the United States, in Canada, Hawaii, South and Central America.

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Torit Appoints

AT A recent meeting the directors of the Torit Manufacturing Company of St. Paul, Minnesota, announced the appointment of Edward J. Girk as President of that company.

Mr. Girk has been Vice President in charge of sales and advertising for several years. He succeeds Arthur E. Swanson, who becomes Chairman of the Board.

At the same time L. F. Koering was made a Vice President and G. A. Huna was reelected Secretary.

The Torit Manufacturing Company, organized in 1917, manufactures a complete line of cabinet and cyclone type dust collectors for industrial use. The headquarters are located at Walnut & Exchange Streets, St. Paul 2, Minnesota.

Du Pont Sesquicentennial

THE 150th anniversary of the DU Pont Company was observed July 18 in ceremonies at the site of the company's first mill on Brandywine Creek in Wilmington, Del.

An audience of nearly 7,000 people, mostly active and retired Du Pont employees and members of the du Pont family, attended. Employees were selected to represent each of Du Pont's 71 plants and many of its laboratories and sales offices. They came from 25 states, some as distant as the West Coast. In addition, thousands of men and women at the company's plants, laboratories, and sales offices across the nation held their own celebrations.

The program in Wilmington included an historical dramatic prologue depicting the company's founding. After the prologue, Henry B. du Pont, great-great-grandson of the founder, and a vice-president and member of the Du Pont executive committee, spoke, followed by Crawford H. Greenewalt, president, and Walter S. Carpenter, Jr., chairman of the board of directors.

In the prologue the roles of Eleuthere Irenee du Pont de Nemours, founder of the company, and his wife, Sophie, were portrayed by Eduard Franz and Miss Sigrid Gurie, who played the same roles in the motion picture, "The Du Pont

(For further details on advertised products, use the Readers Inquiry Card on page 75)

Story." Written by Irve Tunick, the prologue tells of the dreams of Eleuthere Irenee du Pont and his faith in the new nation.

A marker, formed by one of two huge millstones ordered from France by the founder of the company, was dedicated. The stone weighs about seven tons and is mounted on a granite base. Its function was to grind, by water power, the ingredients of black powder—sulfur, charcoal, and saltpeter. Bronze plaques designed and executed by Domenico Mortellito, Wilmington sculptor, are mounted upon the stone.

Luther D. Reed, who retired recently as director of Du Pont's trade analysis division, was executive director of the 150th anniversary organization. He explained that the occasion commemorates the dynamic growth from a single small mill filling the vital need of a young nation for blasting powder and gunpowder, into an organization employing 87,000 men and women, owned by more than 140,000 stockholders, selling thousands of chemical products to more than 75,000 customers, and buying from more than 30,000 suppliers.

Employee participation was emphasized in all plants for the celebration. Approximately 6,000 of the guests were Wilmington area employees with seven or more years service, representatives from 71 plants, and retired employees. The remainder were members of the du Pont family, a group of national and civic government leaders, and representatives of the major manufacturing and financial establishments in Wilmington and Delaware.

Du Pont also marks its 150th anniversary year with the publication of a book, "Du Pont—The Autobiography of an American Enterprise." The theme of the book is the parallel development of the Du Pont Company and the nation over a century and a half. Largely pictorial, with many illustrations in color, the book relates the company's activities and operations to broad economic and social developments in the United States.

York Harbor, Me.

September 11–12. Twenty-fifth Annual Maine State Safety Conference (Marshall House). A. F. Minchin, secretary, Industrial Safety Div., Dept. of Labor & Industry.

Cleveland, Ohio

September 16–18. Fourteenth Annual Ohio State Safety Conference. (Hotel Carter). Carl L. Smith, Secretary-Treasurer, Ohio State Safety Council, 2073 E. 9th St., Cleveland 15, Ohio.

Chicago, Ill.

Oct. 20–24. Fortieth National Safety Congress & Exposition. R. L. Forney, General Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Cleveland, Ohio

October 20–24. Eightieth Annual Meeting of the American Public Health Association, (Public Auditorium). Dr. Reginald M. Atwater, Executive Secretary, American Public Health Association, 1790 Broadway, New York, N. Y.

Houston, Texas

October 27–31. Combined meeting of the National Rural Electric Job Training & Safety Congress, and the Texas Job Training & Safety Training Program for Rural Electric Cooperatives, (Shamrock Hotel). W. W. Mills, chairman, National Planning Committee, F. E. 236, College Station, Texas.

Cincinnati, Ohio

November 12–13. Second Annual Greater Cincinnati Safety Conference & Exhibit. (Gibson Hotel) Kenneth R. Miller, Coordinator, c/o Greater Cincinnati Safety Council, 1203 Federal Reserve Bank Bldg., Cincinnati 2, Ohio.

Cleveland, Ohio

January 19–22. Fourth Annual Plant Maintenance Show & Conference, (Public Auditorium). Clapp & Poliak, Inc., exposition managers, 341 Madison Ave., New York 17, N. Y.

Engineering Handbook

(From page 51) taken place, with the resulting need for an up-to-date version of this popular reference work. The discussions on mathematics, thermodynamics, and fluid mechanics have been entirely rewritten or revised. Similar treatment has been given to the sections on electricity and magnetism, engineering materials, and engineering law. A new section on aerodynamics stresses theory basic to the design and performance of aircraft.

Many other changes serve to develop the basic facts and principles presented in the book. The engineering tables, for example, now include standard structural sizes for aluminum, as well as data on tangents and offsets for the use of civil engineers. At the same time, the table on standards and symbols has been brought up to date, and new tables added for surveyors. The MKS system of units not only has been incorporated into the table of conversion factors, but receives greater emphasis throughout the entire edition.

The second edition of "Handbook of Engineering Fundamentals" contains 1324 pages and is priced at $10.00 from John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y.

industrial Hygiene

ASSOCIATE EDITOR
JACOB A. GOLDBERG, A.M., Ph.D.

Public Health Meeting

THE 80th Annual Meeting of the American Public Health Association and the annual meetings of 38 related organizations will be held in the Public Auditorium, Cleveland, Ohio, October 20–24, Dr. Reginald M. Atwater, Executive Secretary of the Association, has announced. He said more than 5,000 professional public health workers from all parts of the free world will attend.

Public health is teamwork, Dr. Atwater said. It uses the skills of physicians, dentists, nurses, engineers, statisticians, veterinarians, sanitarians, nutritionists, health educators, entomologists, biologists and many others in pursuing its objective which is the protection and promotion of personal and public health.

The American Public Health Association, he said, provides a professional home for these specialists working in public health and its Annual Meetings provide a common ground for their exchange of experience and consolidation of opinion.

Dr. Atwater said the subjects to be covered in the scientific program at Cleveland include: Tuberculosis, Virus Diseases, Professional Education, Hepatitis and Leptospirosis Infections, Interpreting Fluoridation Projects to the Community, Research in School Health, Group Methods in Public Health Programs, Nutrition Consultants and Nurses Work Together, Animal Diseases of Economic and Health Importance to Man, Home Care Programs, Role of the General Practitioner in Organizing Health Programs, Results of Chronic Disease Programs, Industrial Medical Services, Food Processing and Sanitation, The Nutritional Survey in Program Planning, The Social Environment in Health and Disease, Use of Audio-Visual Aids, Critiques of Recent School Health Publications, Population, and The Contribution of Medical Health Librarians to Health Statistics.

The Lasker Awards for 1952 for outstanding contributions in medical research and public health administration will be presented on Tuesday evening, October 21. The Sedgwick Memorial Medal, given for distinguished service in public health, will be awarded at the Banquet Session on Thursday enening, October 23rd.

Local arrangements are being made under the direction of Dr. Harold J. Knapp, Commissioner of Health of Cleveland, Dr. Atwater said.

When Is Noise Harmful?

SAFETY limits for industrial noises harmful to the workman's ear were described in New York by Dr. Howard C. Hardy, acoustics expert for Armour Research Foundation of Illinois Institute of Technology, Chicago.

In an address before scientists at a meeting of the Acoustical Society of America at the Hotel Statler, he presented a graph which for the first time shows upper and lower limits of safety for industrial noises.

Dr. Hardy, assistant chairman of the Foundation's physics research department, stated that his study revealed that loudness and intensity are not conclusive keys to ear damage. Frequency is a no less important, if not misunderstood factor, he said.

The new graph is based on sones (units of loudness) and critical octave bands of frequency.

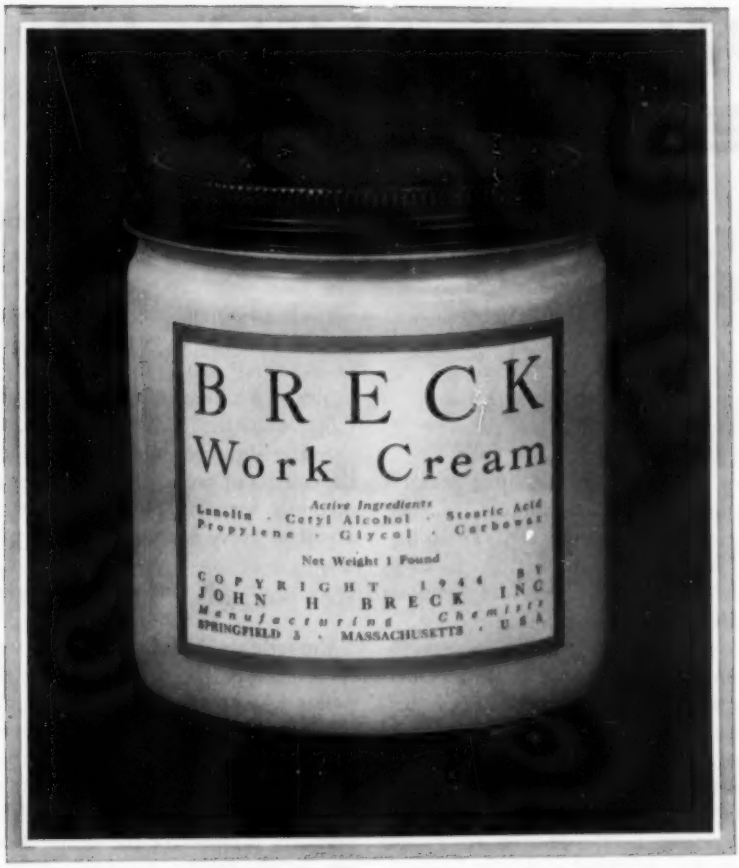
One curve on the graph describes noise levels below which no hearing damage results even after years of working day exposure. A second curve charts a noise level above which hearing will be impaired after an extended period of time. "No Man's Land" is the bracketed area between the two curves.

Dr. Hardy reported that less damage is done to the human ear by constant loud, low-frequency noises than by less intense but shriller noises. The 4,000 cycles per second frequency zone was termed most dangerous.

Subways and street cars are in the harmless noise class, while riveting in the construction of ships and boiler room activity fall into the danger bracket.

Most common noises are not damaging, says Dr.

(Continued on page 71)



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(For further details, use the Reader's Inquiry Card on page 75)

FEATURE

CLEAN UP THAT

This is the second of a series of three feature articles on Washroom Sanitation. The next story of the series will appear in the September issue of SAFETY MAINTENANCE & PRODUCTION.

What can antiseptic soaps do for cleaning up industrial dermatitis?

THE duties many industrial workers must perform expose them repeatedly to skin irritants . . . cutting oils, solvents, acids, alkalis, waxes, etc. These materials are definitely conducive to dermatitis. In addition, workers frequently suffer minor cuts and abrasions that are constant potential sources of skin infections.

If a soap used by the workers for their regular washings could include an antiseptic agent, it would obviously be the simplest answer to this very definite industrial problem . . . for an antiseptic agent would reduce the bacteria count of the skin and the danger of skin infections and irritations.

The fact that industrial dermatoses is a serious problem has been demonstrated by the files of the Public Health Service. These files are filled with case histories of workers afflicted with service-connected dermatitis. Year after year, industrial dermatoses heads the list of occupational diseases for which compensation is paid in a wide range of industries.

The sweeping effects of industrial dermatoses on plant production and morale make it the concern of everyone, not just the employees. Industrial physicians and nurses, safety directors, safety engineers, personnel directors, unions, production superintendents, purchasing agents, public health officials and insurance companies are all concerned with this problem.

Industrial physicians and nurses are anxious to alleviate or eliminate industrial dermatitis. This will reduce the number of cases they handle and lower absenteeism resulting from dermatoses.

Personnel managers, purchasing agents, and plant superintendents know how the prevalence of industrial dermatitis affects the morale of the workers, the attitude of their unions and the employee relations of their plant. They are looking for ways of increasing efficiency of the individual workers, ways to reduce the cost of medical care, the cost of absenteeism, costs resulting from disability and ways of maintaining full productivity.

Case histories evidence the fact that plant conditions allowing dermatitis to exist are responsible for lowering employee's morale. The unions have recognized this. The fact that the choice of hand soaps has been a matter for collective bargaining proves that the union officials and members place importance on the hand soap a company buys for the workers' use. The choice of industrial hand soap is among the list of safety, health and sanitation clauses compiled by the Bureau of Labor Statistics, Washington, D. C.

Safety directors and safety engineers recognize that the control of occupational diseases (of which dermatitis accounts for over 50% in many states) is definitely a part of every company's safety program.

Residual Bacteria

Properly used, ordinary soap serves a useful function. As a cleanser, the soap lather has two properties: it removes water-insoluble liquids by emulsifying them, and solid particles of dirt and bacteria by forming a suspension. The mechanical action of rubbing or brushing also contributes to the removal of dirt particles and micro-organisms from the skin. But there still remains the very real problem of the destruction of bacteria which are not removed by washing. Studies of the antiseptic properties of ordinary soaps, made by many authorities over a period of years, have shown that while certain micro-organisms are susceptible to the action of soap, others are highly resistant. There is general agreement that ordinary soaps are not bactericidal against staphylococci, which cause boils and abscesses.

Effective Antiseptic Soaps

If we consider the fact that staphylococci, staphylococcus aureus and staphylococcus albus, make up the main part of the resident flora of the human skin, and that ordinary soaps are without effect against these bacteria, it is not surprising that many attempts have been made to incorporate various chemicals into soaps in order to render them antiseptic. Although some so-called "antiseptic soaps" have been developed, tests of many have indicated a lack of effective bactericidal properties.

This failure to produce a true antiseptic soap has not been for lack of antiseptic agents, for such agents have been available. However, a major problem has been that these chemicals may lose their antiseptic properties when incorporated with soap; they may depreciate the germicidal qualities of the soap itself, or they may have to be introduced in such proportions as to make them harmful to the skin.

Of those tested the most satisfactory antiseptic for

DERMATITIS

use in hand soaps proved to be bis (3,5,6-trichloro-2-hydroxyphenyl) methane, a compound more commonly referred to as Hexachlorophene.

Antiseptic Properties of Hexachlorophene Soaps

Extensive tests made of soaps containing 2% Hexachlorophene show that the antiseptic retains its activity when incorporated into soap, that the soap is non-toxic, that neither the Hexachlorophene nor the soap containing this compound produce irritation or sensitivity when used regularly on the human skin. A study made by Drs. Eugene F. Traub, Chester A. Newhall and John R. Fuller arrived at certain conclusions concerning the value of Hexachlorophene in soap. Among the facts brought out are the following.

1. 2% of Hexachlorophene incorporated in toilet soap enabled the subjects studied to maintain an exceedingly low bacterial population on the skin of the hands and forearms.

2. Hexachlorophene was non-irritating to the skin as judged by more than 400 patch tests. Subjects using this soap regularly for one year showed no evidence of irritation.

3. Hand-washing experiments indicate that the most significant results were obtained by the regular daily routine use of Hexachlorophene soap.

4. The remarkably lowered resident flora following the routine use of Hexachlorophene soap was not a result of merely retarding bacterial growth, but actual killing.

5. Hexachlorophene soap when used exclusively is an efficient agent in reducing the number of both pathogenic and non-pathogenic organisms found on the human skin.

6. Regular use of soap containing Hexachlorophene should reduce the probability of infection following abrasions and superficial wounds of the skin.

7. The use of Hexachlorophene soap is suggested for protection against cutaneous infections from barber shops and beauty parlors, hair follicle infections from cutting oils, etc.

Other qualified medical authorities have obtained similar results.

A leading independent health laboratory conducted a series of carefully controlled comparisons involving repeated washings with a soap containing 2% of Hexachlorophene, as contrasted with an identical soap not containing this compound. These tests showed an average bacteria reduction of 94.5% for the soap containing Hexachlorophene; 15.5% for the control bar not containing Hexachlorophene.

An essential requirement for any preparation that is to be used on the skin is that it be non-toxic, non-irritating and non-sensitizing.

For detailed descriptions of washroom products, see pages 262–282 of "Best's Safety & Maintenance Directory": 1952–53 Edition.

In addition to many hundreds of patch tests with Hexachlorophene in other vehicles (petroleum, cream, etc.), one researcher tested 200 individuals with an 8% solution of a standard bar containing 2% of Hexachlorophene. The same type of soap without Hexachlorophene was used as a control. (The lather obtained when washing with a bar of toilet soap varies between a 3% and an 8% solution). He found that positive reactions of the same nature developed in about 4% of the individuals for both the Hexachlorophene soap and the control soap. There were no reactions attributed to the presence of Hexachlorophene in the soap. He also reported the daily use of this soap for over two years by a large number of individuals under his supervision, none of whom showed any untoward reaction. Similar evidence of the non-irritating properties of Hexachlorophene have been reported by other medical studies.

Industrial Studies

Studies of Hexachlorophene soap in actual use by industrial plants have been made by physicians and are equally significant as to the value of such a soap.

1. In a ball bearing factory employing more than 3,000 men and women, 73 subjects were selected and supplied with a soap containing Hexachlorophene and instructed to use no other kind of soap either at home or in the factory. The subjects were examined by physicians at least once a week. The summary report showed that:

"(a) No cases of irritation to the skin were observed, despite the fact that a number of mild and moderately severe cases of dermatitis were in-

cluded in the group, in which the use of any type of soap might well have been expected to cause a flareup of the eruption. In fact, some of the patients with dermatitis seemed to feel that the soap supplied them, which contained Hexachlorophene, was less irritating than the usual soaps they had employed in the past.

"(b) The best results were obtained in the group of cases in which the soap was employed before the patient had a well developed case of dermatitis, folliculitis, oil comedones or boils. The subjects in this group who used the soap regularly remained free of trouble.

"(c) The subjects who had moderately developed cases of oil comedones, folliculitis and furunculosis found that their process was arrested. The old lesions when suitably treated and removed, cleared up promptly and there was little tendency to develop new ones.

"(d) In cases where the process was well advanced and the individual was covered with follicular pustules or boils, the use of the soap alone was not sufficient to clear up the patient.

"(e) It is felt that plants where the subjects are contacting various cutting oils, solvents, etc., should supply a soap containing Hexachlorophene."

2. In a machine tool plant where all the workers were constantly exposed to cutting and grinding compounds, another experiment testing Hexachlorophene soap was made. Comments on this text include:

"(a) Aids in healing minor cuts and scratches and apparent relief in the soreness of the aforementioned cuts and scratches.

"(b) Several of the workers, particularly the women, report that it cleared their skin of pimples, blackheads and other surface blemishes.

"(c) It is interesting to know that thus far in the experiment there have been no cases of occupational dermatitis occurring on this shift while a few incipient ones have appeared on the other two shifts."

3. Because it has been thought by some industrial physicians that industrial dermatitis from cutting oils is frequently aggravated by secondary infections, study was made of the constant use of Hexachlorophene soap by individuals exposed to cutting oils in the grinding department of a machine shop.

Comments include:

"(a) Twelve of the employees using the soap received minor cuts and injuries and it was noted that there was a complete absence of secondary infections in these cases. In ten of the cases, more rapid healing was noted, and in two cases there was no unusual effect noted. From the statement of the first aid man, there were twice as many redressings on minor cuts and injuries among the control group as there were among the group using the soap. He also stated that it took about twice as long for these injuries to heal in the control group.

"(b) This soap apparently has a very good effect in treating acne.

"(c) This soap has a very good preventive effect on secondary infections from minor injuries and promotes rapid healing."

The Employer's Problem

It seems inevitable that workers in most industrial plants will continue to be exposed to daily contact with sources of occupational dermatitis, such as cutting oils, solvents, abrasives, etc., because these materials are essential to the actual manufacturing operations. Since these causes of dermatitis cannot be eliminated, the problem resolves itself into a medical one of keeping the irritation and infection rate as low as possible, and of preventing those cases which do occur from reaching the serious stage.

Any appreciable reduction in this dermatitis has a definite dollar and cents value to the industrial employer. Generally speaking, the employer may not only be liable for all medical and hospital expenses of the employee suffering from occupational dermatitis but also for compensation for wages lost—plus the loss in productive work. For every such severe case, there are many less extreme ones . . . less extreme but still a cause of absenteeism, lessened efficiency and employee grievances and dissatisfaction.

Most industrial medical departments require each worker to report to the medical office every time he suffers a skin irritation, abrasion, or minor cut. This method permits attention to be given to such cases before they become severe.

As a supplement to this practice, the regular daily use of an antiseptic soap in all employee washrooms offers an extremely simple, effective and inexpensive method of reaching those workers who fail to report for medical treatment. The workers are certain to use the dispenser soap for their routine washings, since no extra effort is required. Actual plant studies, such as those listed above, indicate that a soap containing Hexachlorophene does definitely decrease the number of bacteria on the skin and the danger of skin infections.

Hexachlorophene soaps for industrial use in liquid and bar form have gained ready acceptance in industrial washrooms and first aid rooms which had a use for liquid or bar soap.

However, the cleaning requirements of many factory workers exposed to skin abrasions and industrial dermatitis call for a powdered hand soap with a mild but efficient scrubber to remove heavy soil, grease and oil. Antiseptic Hexachlorophene hand soap is therefore also available in powdered form.

These soaps are effective germicides and their regular use results in reduction of the residual bacterial flora of the skin. However, they are not intended for antiseptic use by single applications. Regular daily use is essential to obtain the maximum effect.

From "Antiseptic Soaps for Industrial Use," published by Armour & Co.

THE INDUSTRIAL Nurse

EDITOR
ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

Medical-Nursing Service Standards

A JOINT statement relating to the essentials of medical services in industry has been prepared by the American Association of Industrial Nurses, the Industrial Medical Association, and the Council on Industrial Health of the American Medical Association. This statement was drawn up in order to clarify legal and ethical principles of medical-nursing services in industry, both for members of interested professional organizations and for industrial employers providing any of the listed health services. The following include the major recommendations of this joint committee:

(1) Personal medical services involving the establishment of a diagnosis and the definition of treatment or the performance of specific preventive measures are the function of the physician; however, it is desirable for the nurse to participate in such services if she acts under direct medical supervision or under indirect supervision such as is provided by standing orders.

Standing orders are defined as a written compend of directions outlining services and procedures, approved and signed by a licensed physician and acknowledged by him to be services and procedures that may be performed by a certain nurse under certain circumstances. Such orders should not attempt to delegate the exercise of medical discretion but should serve as authorization for approved routine procedures for common minor conditions and as a directive for emergency care of more serious or complicated conditions until the physician's arrival.

(2) In the absence of direct medical supervision, the nurse should acquaint her employer with the legal and ethical scope of her services. She should at no time exceed the limits imposed on her by training and licensure. If the nurse is asked to perform services exceeding her legal and ethical limitations, she should seek advice from the nearest official medical and nursing agencies.

(3) In respect to industrial health services other than those listed as personal, the nurse can exercise considerable initiative. Practical limits must be based on her training, experience, and the availability of qualified consultants.

What's Wrong?

NURSES who have had much experience in out-patient departments or in industrial medical clinics are well aware that patients usually come with a specific, self-diagnosed complaint and request treatment for a definite pain, ache, or defect. They get what they ask for and go away. Only infrequently is a complete history taken, and even then many items are not included. An effective and in some ways, an ingenuous method has been worked out to overcome this tendency of self-diagnosis and ignoring of conditions that might be serious.

This is a medical-index-health questionnaire used in a well-known medical school and its out-patient department. A total of 195 questions requiring simple yes and no answers helps to determine what areas need checking and examination. For instance, in the case of a middle-aged woman who complained of pains in the ears, she was referred to the ear clinic by the O.P.D. admitting physician. Clinical improvement was noted after three visits. No other examinations were done or were requested. Using the medical-index-health questionnaire in a follow-up study, this patient reported 54 complaints that seemed to indicate that she needed general medical care for symptoms of disorders of eyes, ears, respiratory tract, blood pressure, cardiovascular system, urinary tract, teeth, gallbladder, skin, gynecological endocrine system, weight, veins of lower extremities, and emotional disorders. The patient admitted on reexamination that she wanted a general checkup, but did not know how to go about asking for it and getting the care she needed. Many of her subsequent complaints were found to be justified and required considerable medical care. This woman was but one of

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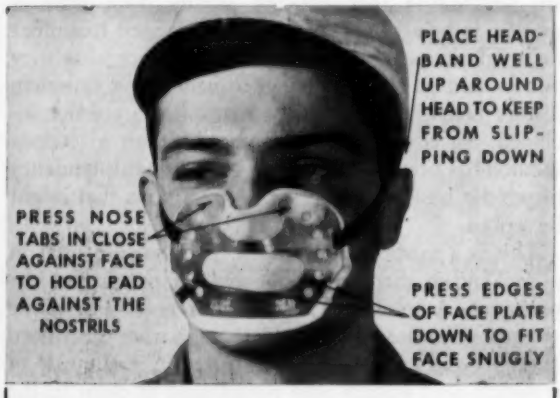
many men and women upon whom the experiment of getting rather complete data was tried out. It changed the previous and common practice of patients coming to their private physicians and clinic physicians and stating their complaints, with treatment followed in accordance with this procedure.

Perhaps such a plan of questionnaire application, though not necessarily to the same extent, might be tried out in industrial medical departments. Some undoubtedly already use some such method. Much can be learned, and much service could be rendered, either directly or by reference to private physicians or clinics.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Arthritis and Rheumatism

THE keen medical and popular interest aroused a short time ago by the introduction of cortisone and ACTH on an experimental basis has helped to highlight the national problems of arthritis and rheumatism. The importance of these two conditions as common chronic diseases and as leading causes of much suffering and disability has become fairly well recognized. In 1935 it was estimated that there were at that time 6,850,000 persons of all ages in the country with "rheumatism," including under that title all cases of muscular rheumatism, lumbago, arthritis, gout, "neuritis," and "neuralgia." The latter two terms cover so many possible conditions that their classification was looked upon with some question.

In the light of new possibilities of effective treatment of the rheumatoid diseases, greater efforts are apparently warranted in the making of accurate diagnoses and the use of available therapies. Studies undertaken in the fall of 1951 by the Public Health Service undertook to obtain new estimates of the number of recognized cases of chronic arthritis and muscular rheumatism in the United States. The total estimated number of cases was determined as reaching 10,104,000 persons aged 14 years and over who believed they had arthritis or rheumatism. The prevalence of presumptive cases is 9.3 per cent of the total population. A total of 6.9 per cent were seen by a physician; of these, 5.9 per cent were diagnosed as having arthritis or rheumatism. The prevalence among females was found to be considerably higher than among males. About 25 per cent of the presumptive cases had made some significant change in the amount or type of work they performed, or in their usual activities, because of the complaints from which they suffered.

Working Mothers

THE civilian woman labor force, which includes both the employed and the unemployed, was estimated at 18,800,000 in April 1952. Of these, about

17,422,000 were employed in non-agricultural occupations, while the balance, or 812,000, were occupied in agriculture. The employment of such a large number of women raises many questions of health maintenance and protection. A major facet deals with the care of prospective mothers or pregnant women. Various policies are followed insofar as allowing such women to continue on the job.

The New York State Division of Industrial Hygiene and Safety Standards recommends: (1) In general, the pregnant woman can perform the usual tasks she did before pregnancy unless they are unusually strenuous or the environment hazardous: (2) Physicians agree that work, if it is not excessive in hours and does not involve exposure to special health hazards, is usually good rather than bad—at least during the early part of pregnancy: (3) Pregnant women should not be employed on a shift including the hours between 12 midnight and 6 a.m.; for more than 8 hours a day, nor more than 48 hours a week. It is desirable that the work week shall not exceed 40 hours.

There are certain physical limitations which must be considered, including strain of muscles, or joints as in heavy lifting, stretching and continuous standing. In the early months of pregnancy, the worker is more subject to nausea and fainting. She may react more violently to unpleasant temperature and humidity conditions, and may be more conscious of odors. However, these reactions are largely functional and not dangerous. If the general conditions in the plant are good for the ordinary worker, they will usually also be satisfactory for the pregnant worker. There are a number of potentially toxic substances commonly used in industry which should be avoided by pregnant women. These include, among others, phosphorus, manganese, turpentine, mercury, lead, arsenic, benzol, nitrous fumes, carbon disulphide, carbon monoxide, aniline, nitroglycerine, insecticides, and various pharmaceuticals. When in doubt, consult the plant physician, or refer the pregnant woman to her own physician for advice.

When Is Noise Harmful?

(Continued from page 64)

Hardy, because they are not loud enough and exposure time is too short.

A rule of thumb was suggested by Dr. Hardy: Industrial noise is in the danger zone when a workman is forced to shout into his neighbor's ear to converse. Noise is safe if conversations may be carried on in a normal voice at a distance of one foot.

Information gained through Dr. Hardy's pioneer work will be of value to industry in determining dangerous noise areas.

He explained that his conclusions are supported by few data in acoustics literature. However, he said that evaluation of clinical data, now being conducted by medical experts, is expected to confirm his findings and also point up damage risk levels.

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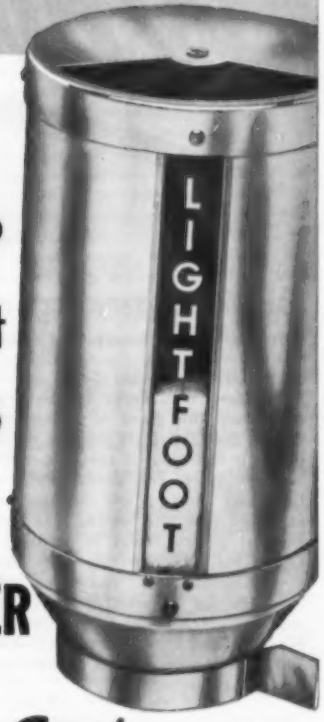

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GLARE-ABSORBING COATING

(Use Key # 615 on Inquiry Card on page 75)

A BLUE translucent liquid coating for windows is made by The Skybryte Co. to reduce the glare of direct sunlight. Called No-Glare, the coating, easily applied by brushing or spraying, eliminates sunlight glare yet admits 94% of the light. By filtering out the heat creating infra-red rays, the coating also keeps industrial plants cooler in summer. No-Glare will stay on the glass until removed by hot water and a stiff brush. It is unaffected by weather conditions and will not crack or peel. Its use prevents eyestrain and nervous irritation which result in lower production, greater spoilage and more accidents.

FOUR NEW RESPIRATORS

(Use Key # 616 on Inquiry Card on page 75)

FOUR new respirators designed to provide maximum protection, comfort and service, are now being offered by The DeVilbiss Company. The new respirators were built to improve design, increase operating efficiency and augment the present line. In addition to a new filter and a new cartridge respirator, The DeVilbiss Company is offering two Bureau of Mines approved respirators, one for protection against dust and the other model which safeguards against fumes and vapors.

The MSC (cartridge), which is shown at center on table, is said to protect against low concentrations of light organic fumes; vapors and gases encountered in spray painting, degreasing, dry cleaning, cementing and similar operations and usable in the presence of benzene, sylenemtoluene, gasoline, naphtha, acetone, turpentine and other fumes of this type.

The MSF (filter), at left on table, is used for protection against light concentrations of nuisance dusts produced in some grinding operations, coal yards, grain elevators, cement mills, woodworking plants and other exposures not involving pneumoconiosis, silicosis or asbestosis producing dust.

Where protection is needed against poisonous and disease producing dusts as well as against a combination of all dusts, toxic, nuisance and pneumoconiosis producing, the MSD (filter), Bureau of Mines approved model, is recommended. It is shown at right.

Model MSE (double cartridge), which also has the approval of the Bureau of Mines, protects against low concentrations of light organic fumes, vapors and gases encountered in spray painting, degreasing, dry cleaning, cementing and similar operations. Worn by the man in the picture, it is usable in the presence of benzene, zylene, toluene, gasoline, naphtha, acetone, turpentine and other fumes of this type. It also protects against DDT and other insecticide sprays having a volatile carrier.

Respirators, replacement cartridges and filters are available for immediate delivery.

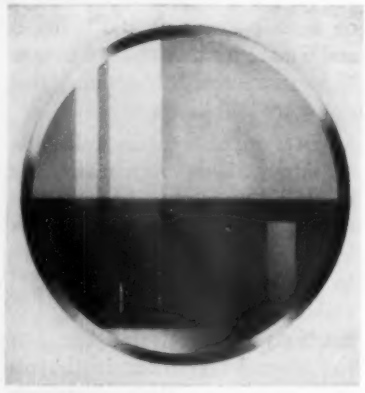
BI-COLOR LENSES

(Use Key # 617 on Inquiry Card on page 75)

A ONE-PIECE bi-colored lens, designed specifically for workers exposed to intense visible light, ultraviolet and infrared radiations, is announced by American Optical Company.

Hardened for utmost impact protection, following the company's special fusing process, the new "double feature" lens has the strength of a single lens and can be replaced in less than half the previous time required.

Where one half of the integral lens meets the other half, there is no junction that might collect dirt or foreign matter and obstruct vision. Light streaks are avoided and reflections cannot distract, annoy or endanger the worker.



Beveled to fit metal or acetate spectacle goggles and also cup-type goggles, the new bi-colored lenses come in varying shades and can be obtained in both flat and six curve in the following half and half combinations: Cobalt-Clear, Noviweld-Clear, Calobar-Clear, Noviweld-Calobar and Noviweld-Noviweld.

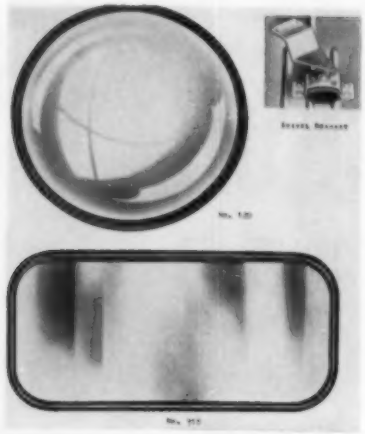
WAXLESS, ANTI-SLIP FLOOR FINISH

(Use Key # 618 on Inquiry Card on page 75)

CONSOLIDATED LABORATORIES, INC. have developed and perfected a new protective floor coating that provides high anti-slip properties to all floors where slip hazards may exist. It is a waxless, water-emulsion product with a high coefficient of friction.

Applied in the same manner as wax type floor finishes, the product called SKIDPROOF has no chemical reaction on any color or surface. No buffing is necessary as it dries bright in a short time on asphalt tile, rubber, rubber tile, cork, linoleum, composition, wood and all sealed, painted or varnished floors.

It requires no special maintenance nor unusual handling and is recommended for floors where a high, hard, safe gloss is desired. The company states that the product is approved by Underwriter's Laboratories, is water resistant and will not track off or yellow with age. Normal maintenance procedures keep it bright and lustrous.



INDUSTRIAL TRAFFIC MIRRORS

(Use Key = 619 on Inquiry Card on page 75)

A NEWLY developed line of Klear-Vu Safety Mirrors for industrial use is announced by Lester L. Brossard Co. They are especially designed for use in factories where blind corners, cross aisle intersections, entrances and exits present a serious safety problem because of traffic accidents.

Installed in these locations, at a height of 8 to 10 feet, Klear-Vu Safety Mirrors clearly reflect the movement of oncoming floor traffic from opposite directions —thereby removing the principal cause of collisions. The mirrors are easily installed and are adjustable for setting at any desired angle. Diameter dimensions of two circular *convex* glass mirrors offered are:—12" and 18". Two sizes are offered in flat rectangular glass mirrors: —9" x 18" and 16" x 24". They are also adaptable for use on various types of production machinery and equipment.

SAFETY FLASHING LANTERNS

(Use Key = 620 on Inquiry Card on page 75)

THE Justrite Manufacturing Company has introduced a new safety red flashing lantern for use in all Class I, Group D hazardous locations as well as other spots requiring a warning or marking light.

This portable, battery-powered lantern, Model 2146-S, houses a red lens and a sliding switch assembly controlling two bulbs. One position of the switch produces a steady red beam, which can be instantly changed to a flashing red light merely by moving the switch.

Additional safety features of the lantern include Justrite's "kick-out" bulb socket which eliminates danger of explosions in the event of a broken bulb, heavy wire guard which protects the globe against breakage, spark-proof construction of all protruding parts, and mounting on a movable base which makes the beam adjustable to any desired angle. In addition, this dependable light has the approval of Underwriters Laboratories, Inc., the U. S. Bureau of Mines, and the U. S. Coast Guard Merchant Marine Technical Division. Blinking power of the 2146-S Safety Lantern is good for in excess of 52 hours of continual burning.

PORTABLE EMERGENCY SHOWER

(Use Key = 621 on Inquiry Card on page 75)

TO MEET the increasing risks and hazards of fire, acids, radiological, bacteriological and other contaminants to the human body, emergency showers are now being widely used in industry, schools and laboratories. Instantaneous wetting and washing of all parts of the body and clothing of persons exposed has been found very effective in reducing serious injuries.

To meet the demand for emergency showers at points of remote hazard or where physical conditions do not permit permanent installation, Logan Emergency Showers, Inc. has designed a completely portable unit that can be moved from place to place quickly and easily. While particularly suited for use on loading docks, air fields, oil fields and similar locations, they find wide application in all instances where hazardous activity covers wide areas either indoor or outdoor. In fact, they can be used wherever a water supply is available. Couplings for connection to the water system in use in each instance are furnished with the unit.

Mobility is achieved by easy rolling casters of ample size. The unit is held fixed in position by means of adjustable truck stops. A ramp is provided, for easy access to the shower, which locks into position out of the way when shower is being moved.

This mobile shower embodies all of the features of advanced design that are incorporated in the new Logan Emergency Showers for permanent installation: an ingenious arrangement of sprays—four overhead, two special sprays for eyes and face, and four bottom sprays that direct water upward under smocks, coats, etc. and four streams are directed to the feet. Shower can be entered from either of two sides. Valve for turning on water is operated by swinging gate that is activated by slightest pressure applied by any part of the body of the user.

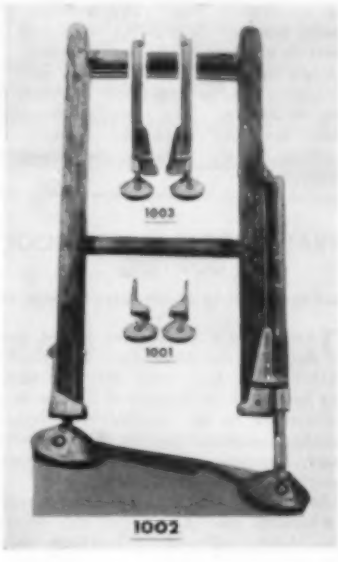
BALL & SOCKET LADDER FEET

(Use Key = 622 on Inquiry Card on page 75)

TO PREVENT the slipping of ladders, particularly on uneven surfaces, the Jon-Ne-Fut Mfg. Co., Inc. is marketing a ladder shoe of a ball-and-socket design, which allows the safety foot to fit the contour of the surface at all angles.

The ladder feet are constructed of high grade materials and precision machined for quick and easy adjustment. A rubber insert on the bottom provides a non-slip gripping surface for dry areas and can be interchanged with a spiked insert for snow, ice, oily wood or asphalt.

Also available is a ladder stabilizer which permits one leg to be lengthened for use on steeply slanting surfaces, steps, etc. Its use eliminates the unsafe practice of blocking or digging holes to level ladders. It carries the U.L. label.



CONDUCTIVE BOOTIE

(Use Key # 623 on Inquiry Card on page 75)

A NEW development in the fight against static electricity explosions in hospitals and industry is the Conductive Bootie, manufactured by the Walter G. Legge Company, Inc. Worn over ordinary shoes, the Conductive Bootie assures positive skin-to-floor contact. Made of superior grade cotton sail cloth, with conductive sole applied, contact is maintained by means of a chain which connects the conductive sole with a metal plate worn in an elastic garter around the calf of the leg, or on the flexible conductive band at the top of the Bootie. Tested to 250,000 ohms resistance, the resistor unit offers protection sufficient to withstand direct contact with a live wire or short circuit.

Made in three sizes, small, medium and large, for male and female, the Bootie is sterilized after each wearing, thus no pair need be individually assigned. Chain, elastic garter and resistor unit are removed before sterilizing and easily re-adjusted afterward—or entire unit may be wholly sterilized.

Sterilization safeguards the soles from the adherence of insulating wax deposits, which tend to insulate the wearer from the conductive floor. The problem of sparks from the floor to the nail heads of shoes is also overcome by the Bootie.

Light in weight, the Bootie is said to be highly durable and easily repaired in case of damage. The manufacturer suggests hospitals store the product in scrub-up rooms adjacent to operating rooms.

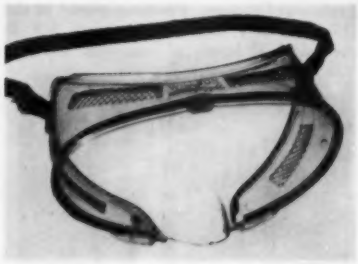
TRANSPARENT WATERPROOF COATING

(Use Key # 624 on Inquiry Card on page 75)

DASHIDE, a transparent liquid, product of the DASCO CHEMICAL COMPANY, Inc., until recently under test by the U. S. Bureau of Standards is claimed to be an exterior wall waterproofing compound that actually will withstand hurricane-driven rain and water even years after application.

As part of the exhaustive field tests, DASHIDE was applied to the stucco, glass brick and cement buildings three years prior to a recent hurricane. After two days of rain driven by winds up to 100 to 125 mph, the interiors of the buildings were officially inspected. No moisture of any sort had penetrated the DASHIDE treated walls. Untreated walls showed saturation.

The product is completely colorless. Brushed or sprayed on, it penetrates ¼" to ½" into the wall surface, depending on porosity. It breaches and seals all hairline cracks, with no effect on the outward appearance of the walls so treated. It is resistant to acids, alkalis and temperature extremes without checking, cracking or peeling. It has been widely tested on armed forces, government and industrial installations from coast to coast.



ALL-PLASTIC GOGGLE

(Use Key # 625 on Inquiry Card on page 75)

AN IMPROVED, all-plastic safety goggle is being offered by Willson Products, Inc., manufacturers of personal safety equipment.

Outstanding feature of the new goggle is a flexible, fully transparent frame molded of Vinylite. Although the new frame comfortably conforms to all facial contours, a newly designed lens retaining feature adds sufficient rigidity to the frame so that there is no sacrifice of protective efficiency.

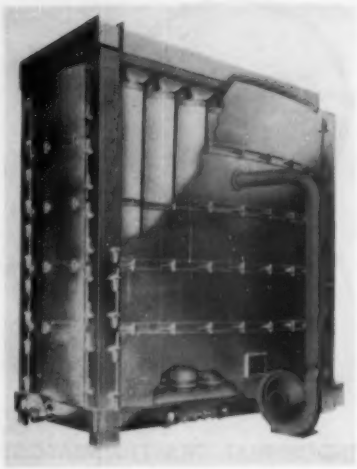
The lens is of .060" acetate, and is separately replaceable—an important economy feature. The goggle provides all-day comfort, since it weighs just over an ounce. It fits easily over all types of prescription glasses. Known as the Willson #91 MonoGoggle, the new item is an addition to the company's present line of MonoGoggles which have been widely used in industry for many years.

DUST FILTERS FOR ABRASIVE DUSTS

(Use Key # 626 on Inquiry Card on page 75)

ABOUT a year ago a complete new dust control system employing special units of the Hersey type, automatic-continuous, cloth tube filter was installed in the Coated Abrasives Division of Minnesota Mining and Manufacturing Company, of St. Paul, Minnesota. The recovery of extremely fine abrasive dusts is highly imperative, and continuous, efficient dust recovery is necessary to maintain rigid production schedules.

The Day Company was given the opportunity to engineer and install the



complete system for this important 3M operation.

The efficient and economical recovery of various abrasive materials demands filters of extremely high filtering ability. In the 3M operation the ability of the Hersey type "AC" filter to recover the finest abrasive dust particles was evident when tests showed up to 99.99% filtering efficiencies. This efficiency is possible because the principle of operation of this type filter permits the use of a high grade filtering felt. Reverse jet rings traveling slowly up and down the cloth tubes clean them continuously, and thoroughly yet are so gentle in their action that they cause no wear to the finest grades of filtering cloth.

In addition, this continuous-automatic cleaning operation of the filter eliminates filter section shutdowns for cloth cleaning, thus filter maintenance costs have remained low. At the same time, plant housekeeping has been easy and has resulted in a clean plant, which has been an aid to employee morale, high production and low plant maintenance costs.

ADHESIVE TAPE IN NEW "CUT-QUICK" PACKAGE

(Use Key # 627 on Inquiry Card on page 75)

JOHNSON & JOHNSON are now marketing their Red Cross Adhesive Tape in a new "Cut-Quick" package that eliminates the use of scissors when a strip of tape is needed. To facilitate industrial first aid, the cover of the metal container does the cutting with its serrated edge. There is no groping or scraping to find the end of the tape, for it is always free of the roll and easy to grasp.

FREE BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE & PRODUCTION. To obtain copies write in the key numbers on the free-postage card below.

PERSONAL PROTECTION

Conserving Manpower 218
Mine Safety Appliances Co. How to conserve our country's most critical resource, the employee, is the subject of an extremely well presented and effective 24-page brochure. With a minimum of words, the booklet presents its message pictorially for industrial management, safety directors and safety organizations. It shows the real threat of accidents to our national welfare and indicates how safety equipment can be used to protect workers.

Protective Clothing 219
American Optical Co. This 48-page catalog offers basic data, in an unusually helpful form, on the company's complete line of protective clothing, including gloves, mittens, finger guards, aprons, cape sleeves, jackets, leggings, spats and hoods. All items are illustrated and are made of such materials as asbestos, leather, fire-resistant duck or cassimere, and coated fabrics. A valuable chart shows the type of protector needed for various hazards in typical industries. Recommended uses are also given for each item of clothing.

Drybrow Sweatbands 220
American Allsafe Co. This 4-page SM&P reprint shows how that the wearing of cellulose sponge sweatbands keeps hot temperatures from sapping workers' energy. Well illustrated, the folder explains that the sweatband aids production by its cooling evaporative effect.

Gloves & Aprons 221
Pioneer Rubber Co. In addition to providing complete information on the full line of liquid-tight all-neoprene, neoprene-coated and vinyl-coated industrial gloves and aprons, this 14-page catalog shows how to choose the right protective glove for the job and how to get the most out of your glove dollars. It considers such factors as the type of hazard, amount of protection required, dexterity, abrasion resistance, slippery parts handling, temperature, color, etc. Included is a chart giving performance ratings for various types of gloves in contact with common industrial chemicals.

Welding Accessories & Safety Equipment 222
Fibre-Metal Products Co. This new 44-page catalog shows a diversified line of welding helmets, hand shields, electrode holders, weld cleaning hammers, protective clothing, testing machines, etc. It contains many new items such as helmet stop, insulated friction joint, combination hard hat and faceshield, headrest welding goggle, safety masks, safety helmets, etc.

Sweat-Safe Safety Shoes 223
Hy-Test Safety Shoes. A 4-page bulletin describes the exclusive Bal Tan sweat-resistant leather insoles used in Hy-Test shoes. These insoles give added life to the shoe under severe conditions and stay soft and pliable for maximum foot comfort.

Lens Cleaning Tissue 224
Silicone Paper Co. of America, Inc. A 2-page bulletin, with a sample of the lens cleaning tissue, describes the silicone-treated paper designed for the efficient cleaning of goggles and glasses. The bulletin also gives details on the convenient dispenser which has adhesive mounting strips and thus eliminates the need for screws, nails, hammering or drilling.

FIRE PROTECTION

Fire Extinguishers 225
Buffalo Fire Appliance Corp. As a quick guide to modern extinguishers and their uses, this condensed pocket-size catalog describes the Buffalo line of hand extinguishers and engines, tells the types of fires each is suitable for, and gives data on recharging and maintenance. The line includes vaporizing liquid, water, non-freeze, soda-acid, dry chemical, carbon dioxide, and foam—approved by Underwriters or Factory Mutual.

MAIL POSTAGE PAID CARD FOR MORE DATA

FLOOR MAINTENANCE

Anti-Slip Floor Waxes 226
E. I. du Pont de Nemours & Co., Inc. Illustrated with color diagrams and photographs taken with an electron microscope, this 14-page brochure tells how tiny particles of "Ludox," a colloidal silica, surround softer wax particles, giving skid resistance and greater hardness, without impairing the basic qualities of gloss, freeze-resistance, water-resistance, and leveling.

Traffic Concrete 227
Flash-Stone Co. A new completely illustrated, 28-page bulletin explains the advantages of Dynapakt concrete floors for industry. It shows how the high density, extremely hard topping is obtained through proper material selection, formulation and installation.

Abrasive Tread Floors 228
The Safe Tread Co. This illustrated 8-page brochure shows how positive slip resistance can be provided by using abrasive materials in floors. Included is data on abrasive metal plates and treads for floors, stairs and ladders, abrasive floor tile and abrasive aggregates.

Water Pick-Up Machine 229
American Floor Surfacing Machine Co. A 2-page bulletin pictures, describes and gives specifications on a water pick-up machine with unusual features: "V"-shaped squeegee blades, bumper guard wheels, squeegee lift control, trailing wire control arm, etc.

SKIN PROTECTION

Answer to Industrial Dermatitis 230
Boyer-Campbell Co. A new 6-page catalog and price list describes the various types of "Skin-Cote," protective hand creams for guarding workers against dermatitis-producing irritants. The catalog contains a comprehensive chart of chemicals and processes and the type of cream recommended for each.

Group Washing Equipment 231
Bradley Washfountain Co. A new 24-page catalog illustrates and describes the savings in water consumption, floor space, installation and maintenance costs, as well as improved sanitation, that can be achieved by means of modern washroom equipment. Full details are given on all types and sizes of group washfountains and showers.

Athlete's Foot Prevention 232
Onox, Inc. How that skin-toughening can prevent athlete's foot is explained in this 4-page bulletin. It describes the mineral salt solution and sponge rubber mat for applying the solution to build up the skin's resistance to fungus attack.

MISCELLANEOUS

Material Handling Equipment Posters ..233
Towmotor Corp. A collection of amusing safety posters embody the theme of safe operation of material handling equipment. The posters, in cartoon style, point up the danger of allowing unauthorized persons to operate fork trucks, the need for sounding audible warnings at blind intersections, and the safe maintenance of the equipment. Towmotor Safety Tips are attractively colored and are suitable for plant bulletin boards.

Highway Warning Signs 234
Eastern Metal of Elmira, Inc. "Safety on the Highway" is the title of this colorful 4-page brochure illustrating and describing several types of traffic signs. Of particular interest are the "A" stand signs for temporary placement by utility workers and maintenance crews to warn motorists that men are working. The stand is designed to remain upright in winds or backwash of passing traffic.

Warfarin Bait Station 235
Prentiss Drug & Chemical Co., Inc. A baiting station for rats and mice is described in this illustrated folder. The unit is designed for use with warfarin rodenticides, which create no bait shyness and cause death by internal bleeding over a period of days.

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Safety, Inc.
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ST. PAUL, MINN.
Continental Safety Equipment, Inc.
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Universal Fire & Safety
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Spokane Safety Appliances
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Williams & Co., Inc.
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Safety Equipment S. A.
Paso de la Reforma 1-856

MONTREAL, CANADA
The Butler Optical Company, Ltd.
1520 Mountain Street

CHICAGO EYE SHIELD COMPANY • 2310 Warren Boulevard, Chicago 12, Illinois

CESCO

CESCO FOR SAFETY

(For further details, use Key Letters "CESCO" on Readers Inquiry Card on page 75)

for industrial *First Aid*

MERCUROCHROME*

(H. W. & D. BRAND OF MERBROMIN, DIBROMOXYMERCURIFLUORESCEIN-SODIUM)

Do not neglect wounds, however small; even scratches and small cuts may become infected if they are not promptly and properly treated.

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'Mercurochrome' solution keeps indefinitely; the color shows where it has been applied.

Physicians have used 'Mercurochrome' for more than 28 years.

Be sure to include 'Mercurochrome' in your first aid supplies.

*Reg. U. S. Pat. Off.

HYNSON, WESTCOTT & DUNNING, INC.

HW&D BALTIMORE, MARYLAND

(For further details, use the Reader's Inquiry Card on page 75)